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Report of

State Highway Commission

For Biennium
Ending December, 1930

Helena, Montana

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REPORT

OF

STATE
HIGHWAY COMMISSION
of MONTANA

FOR BIENNIUM ENDING
DECEMBER, 1930.

HELENA, MONTANA

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STATE HIGHWAY COMMISSION

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W. J. MULVANEY	Billings
J. H. ROWE	Butte

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R. D. RADER, State Highway Engineer	Helena
W. O. WHIPPS, Administrative Engineer and Secretary	Helena

DEPARTMENT HEADS

P. G. POORE, Construction Engineer	Helena
R. P. NEWLAND, Maintenance Engineer	Helena
M. S. HOPKINS, Bridge Engineer	Helena
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B. J. ORNBURN, Designing Engineer	Helena
SEWARD MASON, Testing Engineer	Helena
J. L. MALONEY, Accountant	Helena

DIVISION ENGINEERS

E. B. DONOHUE, Division No. 1	Butte
H. C. TILZEY, Division No. 2	Great Falls
R. J. EPHLAND, Division No. 3	Billings
SCOTT P. HART, Division No. 4	Poplar

LETTER OF TRANSMITTAL

Hon. J. E. Erickson,
Governor of Montana,
Helena, Montana.

Dear Sir:

We have the honor to submit herewith the report of this Department for the biennium ending December, 1930.

Respectfully,

STATE HIGHWAY COMMISSION,
O. S. Warden, Chairman,
W. J. Mulvaney,
J. H. Rowe.

Helena, Montana. December, 1930.

INTRODUCTION

The last report of this department was submitted December, 1928. This present report carries forward to December, 1930, the information submitted two years ago and summarizes all work carried forward in state road construction since we began in 1919 to build roads in Montana with Federal Aid. Full details are given of all construction accomplished since the present state road building program was begun in March, 1927, as a result of the enactment by vote of the people in November, 1926, of Initiative Measure No. 31, the three cent gasoline tax. Since the fiscal and accounting year for Montana is from July to June, statistics and tabulations based on the accounting records of this and other state departments are presented for the period ending June, 1930. Construction contract and other construction records are reported to include December, 1930.

PROGRESS OF IMPROVEMENT OF STATE ROAD SYSTEM

The present state system of roads upon which all construction is being exclusively performed is the Federal Highway or Seven Percent System of Montana, a full description of which appears later in this report. While Initiative Measure No. 31 provided for the construction of not only the Federal Highway System but also for the expenditure of state funds to build three county seat connections not on the Federal Highway System at that time, these three routes connecting the county seats of Virginia City, Red Lodge and Ekalaka with the Federal Highway System have now been included in that system.

The gross official length of the Federal Highway System is 5128 miles, but the actual net logged length, eliminating mileage coincident to two routes and making corrections to bring the mileages into agreement with actually measured lengths, is now 4,944.48 miles. Of this 2,777.74 miles have been improved, of which 2,020.38 miles have been completed to a gravel surface or higher standard, and 756.36 miles have only been graded. This leaves 2,166.74 miles remaining to be improved. The total cost of the improved mileage has been nearly $33,000,000. It will cost perhaps another $25,000,000 to complete to a gravel surface standard the present unimproved mileage, including ordinary bridge construction, but excluding the construction of any large and very expensive bridges to effect needed crossings of the Missouri and other large rivers in this state. To oil this entire System, which may be considered the ultimate objective, will require perhaps nine or ten million dollars more.

These estimated figures for completion of the present approved Federal Highway System do not include allowance for improving three additional routes now pending or other routes which may later be added to the System.

The status of improvement of the Federal Highway System is shown in tabular form by Table No. 1 below.

TABLE NO. I.

STATUS OF IMPROVEMENT OF APPROVED FEDERAL HIGHWAY SYSTEM, DECEMBER, 1930

Grand Total Mileage of Routes 1 to 34 of System, according to Official Mileages approved by U. S. Secretary of Agriculture	5,128.00	
Deduct mileage coincident on two routes, excess of official lengths over actual lengths, etc.	183.52	
Grand Total Actual Net Length		4,944.48
Mileage Improved with Federal Aid 1919-1926	1,153.46	
Mileage Improved with Federal Aid 1927-1930	1,290.74	
Mileage Improved with Forest Road Funds	249.23	
Mileage Improved by Cities and Counties, including City Streets, etc.	84.31	
Total Improved Mileage		2,777.74
Mileage Remaining to be Improved		2,166.74
Improved Mileage Constructed to Gravel Surface or Higher Standard	2,020.38	
Improved Mileage Graded Only, not surfaced	756.36	
Total Improved Mileage	2,777.74	

COST OF IMPROVED MILEAGE—INCLUDING BRIDGES

Classification	Length Miles	Cost	Average Cost Per Mile
Improved with Federal Aid 1919-1926	1,153.46	$13,117,792.55	$11,372.56
Improved with Federal Aid 1927-1930	1,290.74	14,587,747.67	11.301.85
Improved with Forest Road Funds, 1919-1930	249.23	3,864,203.62	15.504.57
Improved by Cities and Counties (cost estimated)	84.31	1,264,650.00	15,000.00
Grand Totals	2,777.74	$32,834,393.84	$11,820.54

It will be observed that since the inception of the state road program in March, 1927, there has been constructed more mileage from 1927 to 1930—and of a distinctly higher type—than during the eight years from 1919 to 1926.

The Forest Highway System mileage coincident with the Federal Highway System comprises 628.38 miles. Of this 249.23 miles has been constructed with Federal forest funds, including some county co-operation, at a cost of about $3,864,000. The Federal aid construction figures shown in Table I include 128.34 miles of coincident forest mileage constructed with Federal aid, leaving 250.81 miles of coincident forest mileage unimproved. Subtracting this figure from the total unimproved mileage of 2,166.74, there remains 1,915.93 miles of the Federal Highway System to be improved exclusive of the Forest Highway System.

CONSTRUCTION 1927-1930

Beginning in 1927, state funds for construction have been allocated according to statutory percentages to the twelve construction districts established by the 1927 Legislature. The full detail of construction for 1927, 1928, 1929 and 1930 by districts is given in following Table No. II.

TABLE NO. II.

CONSTRUCTION CONTRACTS PROGRAM FOR 1927, 1928, 1929 AND 1930

Segregated by Years and Construction Districts

Abbreviations Used:

G for Grading projects.
GS for Grading with Crushed Gravel, Crushed Rock, or Scoria Surfacing Projects.
GHS for Grading and Hard Surfacing Projects.
S for Crushed Gravel, Crushed Rock or Scoria Surfacing Projects.
HS for Hard Surfacing Projects.
RS for Resurfacing Projects
B for Bridge Projects.
RB for Road Betterment Projects.
RG for Regrading Projects.
BR for Bridge Reconstruction Projects.
RGS for Regrading and Surfacing or Resurfacing Projects.
O for Construction Oiling Projects.
SO for Combined Surfacing and Oiling Projects.
UP for Highway Underpasses of Railway Grades.
U for Units of Projects.

TABLE NO. II.

F. A. P. No.	Name of Project	Type	County	Length Miles	Total Estimated Cost Dollars	Federal Aid Dollars	State Funds Dollars	Local Funds Dollars	Source of Local Funds
DISTRICT ONE									
1927 Program									
58C–U 1	Elk Hill, Kal-Libby	G	Lincoln	8.305	119,718.48	67,593.05	52,125.43	....	
58C–U 2	Bridges on above	B	Lincoln	0.007	9,919.80	5,600.72	4,319.08	....	
191B	Polson North	GS	Lake	7.130	76,880.38	57,053.31	19,827.07	....	
200	Polson Bridge	B	Lake	0.571	112,374.69	109,315.69	1,570.22	1,488.78	City of Polson
98B	Mud Creek-Olney	GS	Flathead	11.063	95,966.61	53,189.05	32,777.56	10,000.00	Flathead County
District One Subtotal, 1927				27.076	414,859.96	292,751.82	110,619.36	11,488.78	
1928 Program									
192D–U 1	Arlee-Ravalli	G	Lake	8.168	54,909.55	34,177.74	20,731.81	....	
58D–U 1	Kila Sec., Kal-Libby	G	Flathead	7.003	73,183.33	41,319.30	31,864.03	....	
93	Polson North	RS	Lake	3.230	10,425.10	4,082.22	6,342.88	....	
257A–U 1	Bad Rock Canyon	GS	Flathead	1.383	36,422.65	20,615.22	12,807.43	3,000.00	Flathead County
District One Subtotal, 1928				19.784	174,940.63	100,194.48	71,746.15	3,000.00	
1929 Program									
58D–U 2	Kalispell-Libby	S	Flathead	7.003	29,338.99	15,987.77	13,351.22	....	
192D–U 2	Arlee-Ravalli	S	Lake	8.168	26,167.30	16,314.32	9,852.98	....	
260	Col. Falls-Glacier Park	G	Flathead	1.704	32,481.66	18,384.62	14,097.04	....	
250–A	Libby-Troy	G	Lincoln	6.975	238,850.26	118,209.24	90,641.02	30.000.00	G. N. Ry.
District One Subtotal, 1929				23.850	326,838.21	168,895.95	127,942.26	30,000.00	
1930 Program									
250A–U 2	Libby-Troy	B	Lincoln	0.015	12,266.26	6,942.70	5,323.56	....	
191C–U 1	Big Arm-Rollins	G	Lake	15.150	132,043.00	89,819.53	42.223.47	....	
191C–U 2	Big Arm-Rollins	B	Lake	0.011	5,762.62	3,261.64	2.500.98	....	
194	Ravalli-St. Ignatius	GS	Lake	5.770	60,566.92	33,894.86	26,672.06	....	
263A–U 1	Stryker-Eureka	G	Lincoln	9.077	94,255.97	53,348.88	40,907.09	....	
263A–U 2	Stryker-Eureka	B	Lincoln	0.039	7,549.69	4,273.12	3,276.57	....	
257B–U 1	Bad Rock Canyon-Belton	G	Flathead	10.880	80,873.48	45,774.39	25,099.09	10,000.00	Flathead County
257B–U 2	Bad Rock Canyon-Belton	B	Flathead	0.004	7,162.10	4,053.74	3,108.36	....	
District One Subtotal, 1930				40.946	400,480.04	241,368.86	149,111.18	10,000.00	
District One—Grand Total				111.656	1,317,118.84	803,211.11	459,418.95	54,488.78	

DISTRICT TWO									
1927 Program									
62B–U 1	Chester West	GS	Liberty	7.312	64,524.19	35,371.73	29,152.46		
62B–U 2	Bridges on above	B	Liberty	0.011	3,126.20	1,765.05	1,361.15		
243A	Shelby North	GS	Toole	5.841	72,347.34	40,169.78	32,177.56		
District Two Subtotal, 1927				13.164	139,997.73	77,306.56	62,691.17		
1928 Program									
132A–U 3	Gildford-Joplin	RG	Hill	12.304	23,836.45	12,642.85		11,193.60	Hill County
252A–U 1	Havre-Laredo	G	Hill	15.713	57,629.61	32,537.68	25,091.93		
252A–U 2	Bridges on above	B	Hill	0.070	16,528.05	9,331.73	7,196.32		
132A–U 4	Gildford-Joplin	S	Hill	12.304	66,821.04	35,441.88	31,379.16		
District Two Subtotal, 1928				40.391	164,815.15	89,954.14	63,667.41	11,193.60	
1929 Program									
260	Col. Falls-Glacier Park	G	Glacier	6.049	57,304.09	32,434.11	24,869.98		
252A–U 3	Havre-Fort Benton	S	Hill	15.713	41,114.84	21,939.70	19,175.14		
154B–U 1	Shelby-Cut Bank	G	Toole	6.191	29,018.48	15,391.40	13,627.08		
220B–U 1	Shelby-Cut Bank	G	Toole & Glac'r	12.551	52,954.52	29,972.26	22,982.26		
220B–U 2	Shelby-Cut Bank	B	Toole & Glac'r	0.040	7,000.51	3,962.29	3,038.22		
District Two, Subtotal 1929				40.544	187,392.44	103,699.76	83,692.68		
1930 Program									
62C–U 1	Chester-Shelby	G	Liberty	7.281	24,936.69	14,114.16	10,822.53		
252B–U 1	Box Elder-County line	G	Hill	7.552	23,337.49	13,209.02	10,128.47		
252B–U 2	Box Elder-County line	B	Hill	0.054	10,854.63	6,143.72	4,710.91		
132B–U 1	Gildford-Chester	G	Hill	9.283	27,866.08	14,780.17	13,085.91		
132C–U 1	Gildford-Chester	G	Liberty	9.999	31,609.71	17,891.09	13,718.62		
154B–U 2	Cut Bank-Shelby	S	Toole	6.191	24,971.56	13,679.71	6,291.85	5,000.00	Toole County
220B–U 3	Cut Bank-Shelby	S	Glac'r & Toole	12.544	48,950.12	26,803.70	22,146.42		
District Two Subtotal, 1930				52.904	192,526.28	106,621.57	80,904.71	5,000.00	
District Two—Grand Total				147.003	684,731.60	377,582.03	290,955.97	16,193.60	

F. A. P. No.	Name of Project	Type	County	Length Miles	Total Estimated Cost Dollars	Federal Aid Dollars	State Funds Dollars	Local Funds Dollars	Source of Local Funds
DISTRICT THREE									
1927 Program									
153A–U 1	Dodson East	GS	Phillips	4.240	46,967.38	26.013.87	20,953.51	....	
153A–U 2	Bridges on above	B	Phillips	0.046	6,940.56	3.918.64	3,021.92	....	
155A–U 1	Glasgow West	GS	Valley	5.379	52.439.36	29,017.25	23,422.77	....	
155A–U 2	Bridges on above	B	Valley	0.079	11,005.78	6,213.86	4,791.92	....	
240A–U 1	Poplar-Brokton	G	Roosevelt	14.063	68,725.83	61,171.53	7.554.30	....	
240A–U 2	Bridges on above	B	Roosevelt	0.054	11.042.90	10,133.39	909.51	....	
193A	Culbertson North	GS	Roosevelt	7.306	69,920.16	38,858.68	31,061.48	....	
District Three Subtotal, 1927				31.167	267,041.97	175,327.22	91,714.75		
1928 Program									
251A–U 1	Scobey-East	G	Daniels	7.256	39,235.52	21,526.12	17,709.40	....	
155B–U 1	Glasgow West	G	Valley	14.862	63,458.34	35.828.58	27,629.76	....	
155B–U 2	Bridges on above	B	Valley	0.137	18,471.42	10,148.77	8,322.65	....	
240A–U 3	Poplar-Brockton	S	Roosevelt	14.063	36,153.70	29,290.43	6,863.27	....	
240B—U 1	Culbertson West	GS	Roosevelt	1.878	13,136.80	7,262.33	874.47	5,000.00	Roosevelt County
240B–U 2	Bridges on above	B	Roosevelt	0.010	1,897.50	1.071.33	826.17	....	
253A–U 1	Wolf Point-Circle	GS	Roosevelt	3.832	42,040.54	40,938.41	1,102.13	....	
253A–U 2	Missouri River Br., N½	B	Roosevelt	0.142	331,772.54	331,772.54	....	....	
253A–U 3	Little Wolf Creek Br.	B	Roosevelt	0.014	3,499.10	3,499.10	....	....	
District Three Subtotal, 1928				42.194	549,665.46	481,337.61	63,327.85	5,000.00	
1929 Program									
155B–U 3	Glasgow-Malta	S	Valley	14.862	54,672.39	29,767.06	24,905.33	....	
148A–U 1	Hinsdale Bridge	B	Valley	0.063	37,089.80	20,992.82	8,048.49	8,048.49	Valley County
153B–U 1	Malta-Dodson	G	Phillips	13.736	87,371.19	49,452.09	37,919.10	....	
153B–U 2	Malta-Dodson	B	Phillips	0.136	28,909.10	16,362.55	12,546.55	....	
193B–U 1	Culbertson-Plentywood	G	Sheridan	11.055	53,240.37	30,059.51	23,180.86	....	
193B–U 2	Culbertson-Plentywood	B	Sheridan	0.043	9,193.36	5,190.57	4,002.79	....	
193C–U 1	Culbertson-Plentywood	G	Roosevelt	6.963	34,410.83	19.476.53	14,934.30	....	
193C–U 2	Culbertson-Plentywood	R	Roosevelt	0.030	13,497.33	7,639.49	5,857.84	....	
148A–U 2	Hinsdale-Vandalia	G	Valley	8.473	47,256.93	26.747.42	20.509.51	....	
148A–U 3	Hinsdale-Vandalia	B	Valley	0.119	24,170.57	13,680.55	10,490.02	....	
District Three Subtotal, 1929				55.480	389,811.87	219,368.59	162,394.79	8,048.49	
1930 Program									
240C	Big Muddy Creek Bridge	B	Roosevelt	0.027	16,915.79	13,121.86	3,793.93	....	
142A–U 1	Malta-Vandalia	G	Phillips	13.096	57,749.04	32,685.95	25,063.09	....	
142A–U 2	Malta-Vandalia	B	Phillips	0.052	13,518.15	7,651.27	5,866.88	....	
153B–U 3	Malta-Dodson	S	Phillips	13.736	49,198.92	26,657.99	22,540.93	....	
District Three Subtotal, 1930				26.911	137,381.90	80,117.07	57,264.83		
District Three—Grand Total				155.752	1,343,901.20	956,150.49	374,702.22	13,048.49	

DISTRICT FOUR									
1927 Program									
245A-U 1	Sidney Southwest	GS	Richland	6.132	40,570.71	22,567.46	18,003.25	....	
245A-U 2	Bridges on above	B	Richland	0.014	2,720.30	1,535.88	1,184.42	....	
130B-U 1	Dawson Co. Line-Terry	GS	Prairie	5.368	38,986.49	21,701.24	17,285.25	....	
130B-U 2	Bridges on above	B	Prairie	0.012	8,093.81	4,569.76	3,524.05	....	
District Four Subtotal, 1927				11.526	90,371.31	50,374.34	39,996.97		
1928 Program									
234A	Griffith Creek Bridge	BR	Dawson	0.017	10,248.15	5,786.10	4,462.05	....	
130C-U 1	Terry-Fallon	G	Prairie	9.383	48,506.62	27,386.84	21,119.78	....	
130C-U 2	Bridges on above	B	Prairie	0.015	13,207.09	7,456.72	5,750.37	....	
245B-U 1	Burns—Intake	G	Da'son Richl'nd	10.077	60,449.85	34,129.98	26,319.87	....	
245B-U 2	Bridges on above	B	Da'son Richl'nd	0.029	7,644.34	4,316.00	3,328.34	....	
253A-U 1	Wolf Point-Circle	GS	McCone	2.000	22,777.27	12,541.01	10,236.26	....	
253A-U 2	Missouri River Br. S½	B	McCone	0.062	138,636.30	78,468.14	30,168.16	30,000.00	MCone County & private subscr't'ns
District Four Subtotal, 1928				21.583	301,469.62	170,084.79	101,384.83	30,000.00	
1929 Program									
130C-U 3	Terry-Glendive	S	Prairie	9.383	41,984.31	21,576.92	20,407.39	....	
7U 1	Glendive-Miles City	RG	Dawson	0.796	5,318.10	3,010.04	2,308.06	....	
246A-U 1	Glendive-Circle	G	Dawson	12.915	68,959.37	39,031.00	29,928.37	....	
246A-U 2	Glendive-Circle	B	Dawson	0.112	25,554.53	14,103.04	11,451.49	....	
245B-U 3	Glendive-Sidney	S	Da'son Richl'nd	10.077	27,656.31	14,807.37	12,848.94	....	
158C-U 1	Miles City-Terry	G	Prairie	13.352	62,385.11	35,309.97	27,075.14	....	
158C-U 2	Miles City-Terry	B	Prairie	0.075	16,968.04	9,603.91	7,364.13	....	
61	Red Trail	B	Wibaux	0.036	18,399.80	3,468.50	14,931.30	....	
7U 2	Glendive-Miles City	B	Dawson	0.042	17,617.03	9,971.23	7,645.80	....	
District Four Subtotal, 1929				46.788	284,842.60	150,881.98	133,960.62		
1930 Program									
245C-U 1	Intake-Stipek	G	Dawson	12.751	73,192.65	41,427.04	31,765.61	....	
245C-U 2	Intake-Stipek	B	Dawson	0.140	25,888.83	14,653.08	11,235.75	....	
158C-U 3	Miles City-Terry	S	Prairie	13.348	40,028.56	21,757.13	18,271.43	....	
130A	Clear Creek Bridge	B	Dawson	0.023	4,247.10	....	4,247.10	....	
District Four Subtotal, 1930				26.262	143,357.14	77,837.25	65,519.89		
District Four—Grand Total				106.159	820,040.67	449,178.36	340,862.31	30,000.00	

F. A. P. No.	Name of Project	Type	County	Length Miles	Total Estimated Cost Dollars	Federal Aid Dollars	State Funds Dollars	Local Funds Dollars	Source of Local Funds
DISTRICT FIVE									
1927 Program									
235B-U 1	Lewistown West	GS	Fergus	8.539	61,871.17	34,236.59	27,634.58	....	
235B-U 2	Bridges on above	B	Fergus	0.012	12,492.15	7,053.06	5,439.09	....	
229B	Lewistown East	GS	Fergus	6.102	72,925.24	40,568.33	32,356.91	....	
157B-U 1	Jordan-Miles City	G	Garfield	8.220	23,663.99	13,360.69	10,303.30	....	
157B-U 2	Bridges on above	B	Garfield	0.039	8,136.70	4,593.98	3,542.72	....	
District Five Subtotal, 1927				22.912	179,089.25	99,812.65	79,276.60		
1928 Program									
229C-U 1	Lewistown-Grass Range	G	Fergus	9.311	33,804.55	19,086.05	14,718.50	....	
229C-U 2	Bridges on above	B	Fergus	0.061	11,683.82	6,543.04	5,140.78	....	
235C-U 1	Lewistown-Moore	GS	Fergus	6.554	39,819.52	21,869.51	17,950.01	....	
235C-U 2	Bridges on above	B	Fergus	0.029	4,893.79	2,763.03	2,130.76	....	
26A	Grass Range South	S	Fergus	5.977	24,248.90	13,267.47	10,981.43	....	
26B-U 1	Grass Range North	GS	Fergus	1.417	7,532.69	4,147.09	3,385.60	....	
26B-U 2	Bridges on above	B	Fergus	0.011	1,512.11	853.74	658.37	....	
229C-U 3	Lewistown-Grass Range	S	Fergus	9.311	27,561.70	14,810.41	12,751.29	....	
District Five Subtotal, 1928				32.671	151,057.08	83,340.34	67,716.74		
1929 Program									
256A-U 1	Grass Range-Winnett	G	Petroleum	13.993	70,779.20	40,661.02	30,718.18	....	
256B-U 1	Box Elder Creek Br.	GB	Petroleum	Rd. 0.447 Br. 0.035	18,826.50	10,655.80	8,170.70	....	
229D	Lewistown East	GS	Fergus	1.517	15,208.01	8,460.57	6,747.44	....	
157C-U 1	Jordan-Miles City	G	Garfield	15.976	44,847.06	25,383.44	19,463.62	....	
157C-U 2	Jordan-Miles City	B	Garfield	0.090	21,908.86	11,975.91	9,932.95	....	
256C-U 1	Grass Range-Winnett	G	Fergus	9.163	36,022.80	20,388.90	15,633.90	....	
256C-U 2	Grass Range-Winnett	B	Fergus	0.054	10,628.50	6,015.73	4,612.77	....	
District Five Subtotal, 1929				41.275	218,220.93	122,941.37	95,279.56		
1930 Program									
229E-U 1	Lewistown-Grass Range	G	Fergus	8.978	29,331.81	16,601.80	12,730.01	....	
229E-U 2	Lewistown-Grass Range	B	Fergus	0.018	5,345.56	3,025.59	2,319.97	....	
157C-U 4	Miles City-Jordan	BR	Garfield	....	4,712.71	....	4,712.71	....	
157E-U 1	Miles City-Jordan	G	Garfield	20,751	64,823.24	36,689.95	28,133.29	....	
157E-U 2	Miles City-Jordan	B	Garfield	0.129	28,852.77	16,330.66	12,522.11	....	
103B	Lewistown-Hilger	S	Fergus	11.321	18,606.86	....	10,043.02	8,563.84	Fergus County
229E-U 3	Lewistown-Grass Range	S	Fergus	8.978	25,660.34	14,014.35	11,645.99	....	
256C-U 3	Grass Range-Winnett	S	Fergus	9.163	21,733.93	11,795.97	9,937.96	....	
District Five Subtotal, 1930				59.338	199,067.22	98,458.32	92,045.06	8,563.84	
District Five—Grand Total				156.196	747,434.48	404,552.68	334,317.96	8,563.84	

DISTRICT SIX									
1927 Program									
236A-U 1	Birch Creek South	GS	Pondera	11.260	96,693.78	53,651.83	43,041.95	....	
236A-U 2	Bridges on above	B	Pondera	0.075	15,510.66	8,757.32	6,753.34	....	
235A-U 1	Stanford East	GS	Judith Basin	9.827	61,641.34	33,984.03	26,603.46	1,053.85	City of Stanford
235A-U 2	Bridges on above	B	Judith Basin	0.040	4,380.61	2,473.29	1,907.32	....	
218B-U 1	Gore Hill-Great Falls	GS	Cascade	2.799	27,339.10	14,931.47	1,462.35	10,945.28	Great Falls and Cascade County
218B-U 2	Sun River Bridge	B	Cascade	0.075	63,574.50	35,891.16	....	27,680.34	Cascade County
64	Great Falls-Belt	RS	Cascade	7.310	21,780.00	....	11,780.00	10,000.00	Cascade County
District Six Subtotal, 1927				31.386	290,919.99	149,692.10	91,548.42	49,679.47	
1928 Program									
211A-U 1	Vaughn-Power	G	Cascade	10.365	60,276.51	34,032.11	26,244.40	....	
211A-U 2	Bridges on above	B	Cascade	0.094	12,986.05	7,331.92	5,654.13	....	
180U 2	Great Falls East	HS	Cascade	2.855	72,842.02	38,818.06	24,023.96	10,000.00	Cascade County
64C-U 1	Belt Road	GS	Cascade	1.141	31,256.70	16,930.43	14,326.27	....	
211A-U 3	Vaughn-Power	S	Cascade	10.365	29,535.49	15,875.41	13,660.08	....	
District Six Subtotal, 1928				24.820	206,896.77	112,987.93	83,908.84	10,000.00	
1929 Program									
218C-U 1	Ulm-Great Falls	GHS	City Gt. Falls	0.392	18,195.87	8,414.20	....	9,781.67	City of Gt. Falls
218C-U 2	Ulm-Great Falls	UP	City Gt. Falls	....	45,679.70	25,854.71		19,824.99	G. N. Ry.
151U 1	Bynum-Dupuyer	GS	Teton	13.128	122,109.84	68,084.05	54,025.79	....	
236B-U 1	Dupuyer-Birch Creek	GS	Pondera	5.519	46,666.36	25,971.68	20,694.68	....	
151U 2	Bynum-Dupuyer	B	Teton	0.108	21,350.81	12,084.55	9,266.26	....	
236B-U 2	Dupuyer-Birch Creek	B	Pondera	0.061	11,953.49	6,765.67	5,187.82	....	
10U 1	Sun River Reconstruc.	RGS	Cascade	0.469	9,195.60	5,204.71	3,990.89	....	
10U 2	Sun River Reconstruc.	B	Cascade	0.041	9,588.70	5,427.20	4,161.50	....	
235D-U 1	Armington-Lewistown	G	Cascade-J. B.	10.978	90,907.02	51,453.37	39,453.65	....	
235D-U 2	Armington-Lewistown	B	Cascade-J. B.	0.111	23,955.33	13,558.72	10,396.61	....	
172B-U 1	Missouri River Canyon	G	Cascade	8.509	62,740.28	35,368.69	17,371.59	10,000.00	Cascade County
149B-U 1	Fort Benton-Carter	G	Chouteau	11.778	36,114.21	20,440.64	10,673.57	5,000.00	Chouteau County
District Six Subtotal, 1929				51.094	498,457.21	278,628.19	175,222.36	44,606.66	
1930 Program									
64U 2	Box Elder Creek Bridge Great Falls-Belt Road	B	Cascade	0.015	8,444.22	4,779.42	3,664.80	....	
64	Great Falls-Belt	O	Cascade	13.681	54,385.04	30,781.93	23,603.11	....	
172C-U 2	Missouri River Canyon	B	Cascade	0.103	124,292.35	70,349.47	17,192.88	36,750.00	30,000 Cascade Co. 6,750 G. N. Ry.
235D-U 3	Armington-Lewistown	S	Cascade-J. B.	10.978	55,677.37	30,732.31	24,945.06	....	
149D-U 1	Great Falls-Fort Benton	G	Cascade	12.760	27,124.93	15,332.06	1,792.87	10,000.00	Cascade County
149D-U 2	Great Falls-Fort Benton	B	Cascade	0.050	15,026.89	8,505.22	6,521.67	....	
149C-U 1	Great Falls-Fort Benton	GHS	Cascade	0.547	38,794.65	9,288.06	29,506.59	....	
District Six Subtotal, 1930				38.134	323,745.45	169,768.47	107,226.98	46,750.00	
District Six—Grand Total				145.434	1,320,019.42	711,076.69	457,906.60	151,036.13	

F. A. P. No.	Name of Project	Type	County	Length Miles	Total Estimated Cost Dollars	Federal Aid Dollars	State Funds Dollars	Local Funds Dollars	Source of Local Funds
DISTRICT SEVEN									
1927 Program									
242A-U 1	Elk Park-Woodville	GS	Jefferson	10.003	101,835.90	57,496.54	44,339.36	....	
242A-U 2	Bridge on above	B	Jefferson	0.006	5,528.57	3,121.43	2,407.14	....	
238A-U 2	Dearborn River Bridge	B	Lewis & Clark	0.060	28,376.15	16,021.17	2,354.98	10,000.00	Lewis & Clark Co.
238A-U 1	Road Approaches for Br.	GS	Lewis & Clark	0.807	12,864.51	7,263.30	....	5,601.21	Lewis & Clark Co.
77D-U 1	Helena-Winston	G	Jeff. Br'dw'r.	10.967	53,236.07	30,057.08	23,178.99	....	
District Seven Subtotal, 1927				21.843	201,841.20	113,959.52	72,280.47	15,601.21	
1928 Program									
12U 1	Three Forks-Townsend	RG	Broadwater	1.525	14,985.55	8,460.84	6,524.71	....	
178A-U 1	Helena-Boulder	G	L.&C.-Jeff'son	6.919	61,755.59	34,867.21	26,888.38	....	
204A-U 1	Three Forks-Townsend	G	Broadwater	7.627	35,080.18	19,806.27	15,273.91	....	
204A-U 2	Bridge on above	B	Broadwater	0.011	1,592.80	899.29	693.51	....	
77D-U 2	Helena-Winston	S	Jeff. Br'dw'r	10.967	35,052.53	18,933.59	16,118.94	....	
248A-U 1	Jefferson Canyon	G	Jefferson	4.953	110,896.05	62,611.91	48,284.14	....	
248A-U 2	Bridges on above	B	Jefferson	0.017	23,278.42	13,142.99	10,135.43	....	
178A-U 2	Helena-Bldr. Bridge	B	Jefferson	0.046	31,889.55	18,004.84	9,272.71	4,612.00	G. N. Ry.
178A-U 3	Helena-Boulder	S	Jefferson	6.919	18,542.97	9,996.11	8,546.86	....	
238B-U 1	Dearborn River-Wolf Creek	G	Lewis & Clark	6.047	23,259.86	13,165.08	5,094.78	5,000.00	Lewis & Clark Co.
238B-U 2	Bridges on above	B	Lewis & Clark	0.012	12,874.40	7,286.91	5,587.49	....	
District Seven Subtotal, 1928				45.043	369,207.90	207,175.04	152,420.86	9,612.00	
1929 Program									
12U 3	Three Forks-Townsend	S	Broadwater	1.525	4,382.52	2,364.10	2,018.42	....	
204A-U 3	Three Forks-Townsend	S	Broadwater	7.627	23,322.91	12,659.97	10,662.94	....	
248B-U 1	Jefferson Canyon	G	Jefferson	8.014	145,109.19	82,131.80	62,977.39	....	
77E	Winston-Townsend	GS	Broadwater	10.777	100,155.11	55,753.89	44,401.22	....	
171D-U 2	Jefferson River Bridge N½	B	Jefferson	0.038	31,131.65	17,620.51	13,511.14	....	
171D-U 1	Harrison-Sappington	G	Jefferson	0.984	5,836.63	2,798.33	3,038.30	....	
238B-U 3	Wolf Creek-Augusta	S	Lewis & Clark	6.047	23,982.22	12,838.13	11,144.09	....	
178B-U 1	Helena-Boulder	G	Jefferson	5.533	38,017.81	21,518.08	16,499.73	....	
178B-U 2	Helena-Boulder	B	Jefferson	0.006	5,284.95	2,991.28	2,293.67	....	
172A-U 1	Missouri River Canyon	G	Lewis & Clark	5.210	107,545.50	60,870.75	36,674.75	10,000.00	Lewis & Clark Co.
District Seven Subtotal, 1929				45.761	484,768.49	271,546.84	203,221.65	10,000.00	
1930 Program									
172A-U 2	Missouri River Canyon	B	Lewis & Clark	0.023	11,985.51	6,783.79	5,201.72	....	
242A-U 3	Elk Park Road	S	Jefferson	10,003	41,104.61	23,265.21	17,839.40	....	
77F-204C-U1	Townsend-Toston	G	Broadwater	11.894	73,841.20	41,794.12	32,047.08	....	
77F-204C-U1	Townsend-Toston	B	Broadwater	0.029	18,669.75	10,567.08	8,102.67	....	
242C-U 1	Basin-Elk Park	G	Jefferson	8.707	176,382.14	99,832.29	76,549.85	....	
242C-U 2	Basin-Elk Park	B	Jefferson	0.018	20,732.03	11,734.33	8,997.70	....	
District Seven Subtotal, 1930				30.674	342,715.24	193,976.82	148,738.42	....	
District Seven—Grand Total				143.321	1,398,532.83	786,658.22	576,661.40	35,213.21	

DISTRICT EIGHT									
1927 Program									
215B-U 1	Missoula-Lolo	G	Missoula	1.895	26,315.41	14,857.68	1,457.73	10,000.00	Missoula County
215B-U 2	Missoula-Lolo	S	Missoula	1.895	5,775.63	3,091.54	2,684.09	....	
215C	Missoula-Lolo	GS	Missoula	3.194	36,617.86	20,420.37	16,197.49	....	
237A-U 1	Bonner-Ovando	G	Missoula	3.228	30,117.33	17,004.24	3,113.09	10,000.00	Missoula County
233	Cyr Bridge & Approaches	B	Mineral	0.080	73,856.42	41,699.33	8,178.96	23,978.13	Mineral County
		GS	Mineral	0.148					
231B-U 1	Missoula-Clinton	G	Missoula	4.635	22,477.66	12,690.88	9,786.78	....	
231B-U 2	Missoula-Clinton	S	Missoula	4.635	14,803.45	7,976.92	6,826.53	....	
231A-U 2	Missoula-Clinton	S	Missoula	1.270	4,558.02	2,467.59	2,090.43	....	
206U 2	Turah Hill	S	Missoula	0.871	2,619.55	1,394.30	1,225.25	....	
237A-U 2	Bonner-Ovando	S	Missoula	3.228	9,506.73	5,092.25	4,414.48	....	
District Eight Subtotal, 1927				25.079	226,648.06	126,695.10	55,974.83	43,978.13	
1928 Program									
231B-U 3	Ry. Overhead, Missoula-Clinton	B	Missoula	0.017	8,475.50	4,785.27	3,690.23	....	
184C-U 1	Drummond West	G	Granite	2.030	3,851.10	2,042.62	1,808.48	....	
184D-U 1	Drummond East	G	Granite Powell	11.853	58,428.92	32,988.97	25,439.95	....	
131B-U 1	Turah-Nimrod	G	Missoula	17.420	123,456.74	69,703.67	43,753.07	10,000.00	Missoula County
215D-U 1	Brooks St. Ext., Missoula	GS	Missoula	2.563	18,127.01	10,025.60	3,101.41	5,000.00	Missoula County
254A-U 1	Superior West	G	Mineral	3.945	79,238.25	44,737.91	24,500.34	10,000.00	Mineral County
223A-U 1	Paradise Bridge	B	Sanders	0.184	201,463.62	114,028.40	87,435.22	....	
Disrtict Eight Subtotal, 1928				38.012	493,041.14	278,312.44	189,728.70	25,000.00	
1929 Program									
184C-U 2	Drummond West	S	Granite	2.035	5,595.47	2,851.15	2,744.32	....	
184D-U 2	Drummond East	S	Granite Powell	11.853	36,972.53	20,129.42	16,843.11	....	
215D-U 2	Brook St. Extension	O	Missoula	2.563	5,954.71	3,370.36	2,584.35	....	
254A-U 3	Superior West Underpass	UP	Mineral	....	20,167.62	11,414.87	....	8,752.75	Milwaukee Ry.
259A-U 1	Florence-Hamilton	G	Ravalli	15.617	66,994.62	37,918.95	29,075.67	....	
259A-U 2	Florence-Hamilton	B	Ravalli	0.105	15,550.20	2,307.35	13,242.85	....	
131B-U 2	Turah-Nimrod	S	Missoula	17.420	60,839.85	33,814.85	27,025.00	....	
254B-U 1	Tarkio-Superior	G	Mineral	7.621	68,883.40	38,988.00	19,895.40	10,000.00	Mineral County
215E-U 1	Lolo-Florence	G	Miss. & Ravalli	8.754	64,185.33	36,328.90	17,856.43	10,000.00	Missoula County
215E-U 2	Lolo-Florence	B	Miss. & Ravalli	0.048	16,032.83	9,074.58	6,958.25	....	
223A-U 2	Paradise-Plains	G	Sanders	5.340	47,492.22	26,880.60	20,611.62	....	
District Eight Subtotal, 1929				71.356	408,668.78	223,079.03	156,837.00	28,752.75	
1930 Program									
215ABC	Missoula-Florence	O	Missoula	6.960	23,876.51	6,409.76	17,466.75	....	
131,206,231	Bonner-Nimrod	O	Miss. & Gran.	26.934	72,164.87	31,485.70	40,679.17	....	
184E-U 1	Gold Creek-Kohrs	G	Powell	15.063	187,242.66	105,979.34	56,263.32	25,000.00	Powell County
184E-U 2	Gold Creek-Kohrs	B	Powell	0.026	15,836.15	8,963.26	6,872.89	....	
259B-U 1	Florence-Hamilton	G	Ravalli	11.548	46,669.34	....	46,669.34	....	
259B-U 2	Florence-Hamilton	B	Ravalli	0.145	13,980.45	7,912.93	6,067.52	....	
261A-U 1	Deer Lodge-Butte	GS	Powell	8.670	87,820.72	49,095.25	13,725.47	25,000.00	Powell County
261A-U 2	Deer Lodge-Butte	B	Powell	0.053	28,691.19	16,239.21	12,451.98	....	
District Eight Subtotal, 1930				69.399	476,281.89	226,085.45	200,196.44	50,000.00	
District Eight—Grand Total				203.846	1,604,639.87	854,172.02	602,736.97	147,730.88	

F. A. P. No.	Name of Project	Type	County	Length Miles	Total Estimated Cost Dollars	Federal Aid Dollars	State Funds Dollars	Local Funds Dollars	Source of Local Funds
DISTRICT NINE									
1927 Program									
241A	Dillon-Butte	GS	Beaverhead	9.876	87,448.46	48,498.27	38,950.19	....	
68B	Anaconda Hard Surface	GHS	Deer Lodge	0.616	25,509.45	10,264.42	15,245.03	....	
70C	Butte Hard Surface	GHS	Silver Bow	0.410	18,097.89	6,265.96	11,831.93	....	
70A	Butte-Anaconda Btrment	RB	Silver Bow	....	4,363.62	....	4,363.62	....	
242B-U 1	Butte-Woodville	G	Silver Bow	4.602	143,448.82	78,075.71	....	65,373.11	Silver Bow County
207B-U 1	Butte South	G	Silver Bow	5.895	45,958.14	25,947.96	....	20.010.18	Silver Bow County
244A-U 1	Lyons North	G	Madison	8.336	91,004.63	51,381.21	39,623.42	....	
District Nine	Subtotal, 1927			29.735	415,831.01	220,433.53	110,014.19	85,383.29	
1928 Program									
242B-U 2	Ry. Overhead Butte-Walkerville and Silver Bow Creek Br.	B	Silver Bow	0.035	33,732.05	19,045.11	....	14,686.94	G. N. Ry. Co. & Silver Bow County
207B-U 2	Butte South	HS	Silver Bow	3.651	104,399.57	46,609.17	13,232.99	44,557.41	Silver Bow County
70C-U 3	Butte Hard Surface	HS	Silver Bow	0.085	3,076.49	720.34	2,356.15	....	
68C-U 1	Anaconda-Butte	GS	Deer Lodge & S. B.	1.591	27,728.44	14,385.12	10,343.32	3,000.00	Deer Lodge County
68C-U 2	Bridge on above	B	Deer Lodge	0.010	11,749.10	6,633.54	5,115.56	....	
242B-U 3	Butte-Meaderville	HS	Silver Bow	1.420	43,065.08	....	....	43,065.08	Silver Bow County
241B-U 1	Dillon-Butte	G	B'hd, Md, S. B.	7.805	55,339.34	31,244.59	24,094.75	....	
241B-U 2	Bridge on above	B	B'head & Mad.	0.045	32,873.50	18,560.38	14,313.12	....	
District Nine	Subtotal, 1928			14.642	311,963.57	137,198.25	69.455.89	105,309.43	
1929 Program									
255A-U 1	Dillon South	G	Beaverhead	11.824	91,255.18	51,650.43	39,604.75	....	
255A-U 2	Dillon South	B	Beaverhead	0.012	10,502.80	5,944.58	4,558.22	....	
241D-U 1	Dillon North	G	Beaverhead	12.910	41,600.30	23,545.77	1,260.73	16.793.80	Beaverhead Co.
241D-U 2	Dillon North	B	Beaverhead	0.018	7,942.16	4,495.26	240.70	3,206.20	Beaverhead Co.
241C-U 1	Melrose-Nissler	G	Silver Bow	28.715	240,532.84	136,141.58	9,490.12	94,901.14	Silver Bow County
241B-U 3	Melrose-Lavon	S	B'd, Mad. S. B.	7.805	30,049.80	16,510.10	13,539.70	....	
171D-U 1	Harrison-Sappington	G	Madison	3.747	37,725.40	21,352.58	16,372.82	....	
241C-U 2	Nissler Viaduct	B	Silver Bow	0.103	91,472.70	51,773.55	10,699.15	29,000.00	N. P., Mil. & B. A. & P. Rys.
164	Anaconda-Georgetown Lake	G	Deer Lodge	15.466	103,522.82	58,593.92	....	44,928.90	Deer Lodge Co.
District Nine	Subtotal, 1929			80.600	654,604.00	370,007.77	95,766.19	188,830.04	
1930 Program									
241A	Butte-Dillon	O	Beaverhead	9.855	46,754.36	26,462.96	10,291.40	10,000.00	Beaverhead Co.
241B	Butte-Dillon	O	B'd, Md, S. B.	7.805	20,051.19	11,348.97	8,702.22	....	
241C	Butte-Dillon	SO	Silver Bow	28.715	178,303.41	98,359.14	29,944.27	50.000.00	Silver Bow County
241D	Butte-Dillon	SO	Beaverhead	12.910	85,094.13	47,015.43	38,078.70	....	
164U 2	Anaconda-Georgetown Lake	B	Deer Lodge	0.015	14,636.82	8,284.44	6,352.38	....	
159	Harding Way	RG	Silver Bow	2.000	26,490.22	....	26,490.22	....	
255B-U 1	Dillon South	G	Beaverhead	15.924	142,126.16	80,443.41	51,682.75	10,000.00	Beaverhead Co.
255B-U 2	Dillon South	B	Beaverhead	0.012	6,799.92	3,848.75	2,951.17	....	
164A-U 3	Anaconda-Georgetown Lake	S	Deer Lodge	15.466	46,173.60	25,208.85	15,893.65	5,071.10	Deer Lodge Co.
District Nine	Subtotal, 1930			92.702	566,429.81	300,971.95	190.386.76	75,071.10	
District Nine—Grand Total				217.679	1,948,828.39	1,028,611.50	465,623.03	454,593.86	

DISTRICT TEN									
1927 Program									
222A-U 3	Bozeman East	S	Gallatin	3.343	10,601.58	5,985.65	4,615.93	....	
222B	Bozeman East	GS	Gallatin	2.246	26,656.44	15,050.22	11,606.22	....	
239A-U 1	Wilsall-White Sulphur Spgs.	GS	Park	5.677	71,578.97	39,922.28	21,656.69	10,000.00	Park County
239A-U 2	Bridge on above	B	Park	0.010	5,906.08	3,334.57	2,571.51	....	
239B	Wilsall-White Sulphur Spgs.	GS	Park Meagher	6.326	55,379.18	30,309.24	15,069.94	10,000.00	Park County
217C-U 2	Livingston-Gardiner	S	Park	4.290	11,661.07	6,341.06	5,320.01	....	
217D-U 1	Livingston-Gardiner	G	Park	4.642	51,833.47	29,265.18	12,568.29	10,000.00	Park County
217D-U 2	Emigrant Creek Bridge	B	Park	0.006	5,795.88	3,272.35	2,523.53	....	
217D-U 3	Livingston-Gardiner	S	Park	4.642	16,092.30	8,820.35	7,271.95	....	
127C-U 1	Big Timber East	GS	Sweet Grass	3.015	20,835.98	11,552.27	9,283.71	....	
127C-U 2	Bridges on above	B	Sweet Grass	0.008	6,459.94	3,647.28	2,812.66	....	
127D	Big Timber East	GS	Sweet Grass	2.892	23,756.06	13,183.30	10,572.76	....	
District Ten Subtotal, 1927				37.097	306,556.95	170,683.75	105,873.20	30,000.00	
1928 Program									
239C	Wilsall-White Sulphur Spgs.	GS	Park	4.877	33,837.40	18,638.80	5,198.60	10,000.00	Park County
12U 1	Three Forks-Townsend	RG	Gallatin	1.752	6,919.26	3,906.62	3,012.64	....	
12U 2	Bridge on above	B	Gallatin	0.007	1,128.60	637.21	491.39	....	
8C-U 1	W. Sulphur Spgs. No.	G	Meagher	3.503	23,019.42	12,996.76	10,022.66	....	
239D	W. Sulphur Spgs. Road	GS	Meagher	1.747	27,474.60	11,381.78	6,092.82	10,000.00	W. Sul. Spgs. & Meagher County
		GHS		0.245					
222C-U 1	Bozeman East	G	Gallatin	3.167	52,703.30	29,756.28	22,947.02	....	
217E-U 1	Livingston-Gardiner	G	Park	7.066	73,441.57	41,465.11	21,976.46	10,000.00	Park County
District Ten Subtotal, 1928				22.364	218,524.15	118,782.56	69,741.59	30,000.00	
1929 Program									
12U 3	Three Forks-Townsend	S	Gallatin	1.752	5,042.25	2,719.99	2.322.26	....	
217F-U 1	Yellowstone Canyon	G	Park	10.663	68,744.76	38,909.53	19,835.23	10,000.00	Park County
217F-U 2	Yellowstone Canyon	B	Park	0.006	10,989.80	4,012.35	6,977.45	....	
222C-U 2	Rocky Canyon	S	Gallatin	3.167	30,661.83	16,126.01	14,535.82	....	
171D-U 2	Jefferson River Bridge	B	Gallatin	0.037	31,131.65	17,620.51	13,511.14	....	
171D-U 1	Harrison-Sappington	G	Gallatin	2.244	24,403.35	13,812.29	10,591.06	....	
115B-U 1	Barber-Shawmut	G	Wheatland	6.437	26,049.21	14,743.85	11,305.36	....	
115B-U 2	Barber-Shawmut	B	Wheatland	0.018	5,033.12	2,535.24	2,497.88	....	
185	Livingston West	GS	Park	11.509	108,155.21	55,965.26	52,189.95	....	
127A-B	Big Timber-Columbus	RGS	Sweet Grass	7.628	26,832.42	14,756.99	12,075.43	....	
13U 2	Billman Creek Bridge	B	Park	0.005	6,723.75	3,805.64	2,918.11	....	
169U 1	Three Forks-Carpenter	RGS	Gallatin	4.138	34,651.16	19,394.64	15,256.52	....	
169U 2	Three Forks-Carpenter	B	Gallatin	0.044	26,633.42	15,074.51	11,558.91	....	
District Ten Subtotal, 1929				47.648	405,051.93	219,476.81	175,575.12	10,000.00	
1930 Program									
217E-U 2	Livingston-Gardiner	S	Park	7.066	23,479.76	12,861.45	10,618.31	....	
217F-U 3	Livingston-Gardiner	S	Park	10.663	32,895.99	18,013.51	14,882.48	....	
13, 14, 105, 185	Livingston-Gardiner & Livingston west	O	Park	22.636	50,660.73	28,606.07	22,054.66	....	
177U 1	Logan-Manhattan	GS	Gallatin	6.112	46,385.75	25,818.51	20,567.24	....	
177B-U 2	Logan-Manhattan	B	Gallatin	0.004	4,595.47	2,601.03	1,994.44	....	
217G-U 1	Gardiner Bridge approaches	GS	Park	0.419	13,683.40	7,674.97	6,008.43	....	
District Ten Subtotal, 1930				46.900	171,701.10	95,575.54	76,125.56	....	
District Ten—Grand Total				154.009	1,101,834.13	604,518.66	427,315.47	70,000.00	

F. A. P. No.	Name of Project	Type	County	Length Miles	Total Estimated Cost Dollars	Federal Aid Dollars	State Funds Dollars	Local Funds Dollars	Source of Local Funds
DISTRICT ELEVEN									
1927 Program									
212J	Aberdeen-Wyoming Line	GS	Big Horn	3.618	20,952.89	18,023.86	2,929.03	....	
170B-U 1	Columbus East	GS	Stillwater	6.950	37,492.05	20,614.70	16,877.35	....	
170B-U 2	Bridges on above	B	Stillwater	0.020	16,317.40	9,212.80	7,104.60	....	
107C	Fromberg North	GS	Carbon	7.042	47,015.33	25,991.54	21,023.79	....	
138B-U 1	Roundup North	GS	Musselshell	3.202	33,280.56	18,570.01	14,710.55	....	
138B-U 2	Roundup North	B	Musselshell	0.011					
187C-U 1	Billings-Hardin	GS	Yellowstone	5.385	44,758.06	24,959.87	19,798.19	....	
187C-U 2	Bridge on above	B	Yellowstone	0.011	2,651.00	1,496.75	1,154.25	....	
District Eleven Subtotal, 1927				26.239	202,467.29	118,869.53	83,597.76		
1928 Program									
187D-U 1	Billings-Hardin	GS	Yell. Big H'n	13.335	86,143.22	46,857.97	39,285.25	....	
187D-U 2	Bridges on above	B	Yell. Big H'n	0.112	16,323.96	9,216.50	7,107.46	....	
170C-U 1	Laurel West	G	Stillwater	8.638	32,862.52	18,551.18	14,308.34	....	
170C-U 2	Bridges on above	B	Stillwater	0.044	29,669.75	16,751.54	12,918.21	....	
53A	Custer Coulee Bridge	B	Yellowstone	0.005	5,259.65	2,969.59	2,290.06	....	
	Rock Creek Bridge	B	Carbon	0.030	6,146.32	....	6,146.32	....	
228B-U 1	Billings-Laurel	GS	Yellowstone	6.281	60,319.20	34,140.66	16,178.54	10,000.00	Yellowstone Co.
District Eleven Subtotal, 1928				28.445	236,724.62	128,490.44	98,234.18	10,000.00	
1929 Program									
170C-U 3	Park City-Laurel	S	Stillwater	8.638	31,692.23	17,283.67	14,408.56	....	
228C-U 1&2	Billings-Laurel	GS	Yellowstone	6.194	62,097.08	32,884.26	19,212.82	10,000.00	Yellowstone Co.
258A-U 1	Bridger South	G	Carbon	11.033	50,994.08	28,862.65	22,131.43	....	
258A-U 2	Bridger South	B	Carbon	0.065	14,505.92	8,210.35	6,295.57	....	
115B-U 1	Barber-Shawmut	G	Golden Valley	2.625	11,329.60	6,412.55	4,917.05	....	
115H-U 2	Barber-Shawmut	B	Golden Valley	....	1,292.70	....	1,292.70	....	
108C-U 1	Billings-Klein	G	Yell. Muss'shl	23.896	108,412.48	59,573.83	48,838.65	....	
108C-U 2	Billings-Klein	B	Yell. Muss'sl.	0.115	25,655.46	14,145.16	11,510.30	....	
108A	Billings-Klein	B	Musselshell	0.011	2,308.82	....	2,308.82	....	
	Joliet-Red Lodge	S	Carbon	18.000	27,159.00	....	27,159.00	....	
District Eleven Subtotal, 1929				70.577	335,447.37	167,372.47	158,074.90	10,000.00	
1930 Program									
123A-U 2	Reed Point-Columbus Yellowstone River	B	Stillwater	0.108	85,571.89	48,433.69	37,138.20	....	
123A-U 1	Reed Point-Columbus	G	Stillwater	8.206	61,604.84	34,868.34	26,736.50	....	
123A-U 3	Reed Point-Columbus	B	Stillwater	0.083	52,100.23	29,488.73	9,356.97	13,254.53	N. P. Ry. Co.
187E-U 1	Toluca-Hardin	G	Big Horn	14.261	49,159.63	27,824.35	21,335.28	....	
187E-U 2	Toluca-Hardin	B	Big Horn	0.042	14,700.39	8,320.42	6,379.97	....	
District Eleven Subtotal, 1930				22.700	263,136.98	148,935.53	100,946.92	13,254.53	
District Eleven—Grand Total				147.961	1,037,776.26	563,667.97	440,853.76	33,254.53	

DISTRICT TWELVE								
1927 Program								
135A-U 1	Forsyth East	GS	Rosebud	6.236	57,370.44	32,038.47	25,331.97	
135A-U 2	Bridges on above	B	Rosebud	0.007	7,672.15	4,331.70	3,340.45	
198A	Broadus North	GS	Powder River	6.133	36,250.84	19,227.44	17,023.40	
86C-U 1	Baker East	GS	Fallon	8.442	63,311.49	35,745.66	27,565.83	
86C-U 2	Bridges on above	B	Fallon	0.015	4,785.00	2,701.61	2,083.39	
157A-U 1	Miles City-Jordan	G	Custer R'bud	8.326	39,579.41	22,346.53	17,232.88	
157A-U 2	Bridges on above	B	Custer R'bud	0.036	7,095.66	4,006.21	3,089.45	
District Twelve Subtotal, 1927				29.495	216,064.99	120,397.62	95,667.37	
1928 Program								
135B-U 1	Joppa-Horton	G	R'bud Custer	9.815	56,271.05	31,770.63	24,500.42	
135B-U 2	Bridges on above	B	R'bud Custer	0.013	10,264.81	5,795.51	4,469.30	
15	Bridge on Yellowstone Trail	B	Rosebud	0.017	8,938.65	5,046.76	3,891.89	
114	Bridge on Yellowstone Trail	B	Rosebud	0.025	15,010.93	8,475.17	6,535.76	
158B-U 1	Miles City-Terry	G	Custer	16.421	97,341.42	54,958.96	42,382.46	
158B-U 2	Bridges on above	B	Custer	0.162	35,982.21	20,315.56	15,666.65	
158A	Miles City-Terry Br.	B	Custer	0.007	8,174.65	4,615.40	3,559.25	
135B-U 3	Joppa-Horton	S	R'bud Custer	9.815	30,381.45	16,532.30	13,849.15	
198B-U 1	Broadus-Miles City	GS	Powder River	8.438	38,857.75	20,610.15	18,247.60	
District Twelve Subtotal, 1928				44.713	301,222.92	168,120.44	133,102.48	
1929 Program								
198B-U 2	Broadus-Miles City	B	Powder River	0.022	5,354.80	2,840.18	2,514.62	
S.A.P.47U 2	Baker-Ekalaka	B	Carter	0.029	5,577.60		5,577.60	
135C-U 1	Forsyth-Miles City	G	Rosebud	13.085	70,426.25	39,861.26	30,564.99	
135C-U 2	Forsyth-Miles City	B	Rosebud	0.077	26,835.05	14,843.09	11,991.96	
135D-U 1	Forsyth-Miles City	G	Custer	10.462	127,619.38	72,232.57	55,386.81	
135D-U 2	Forsyth-Miles City	B	Custer	0.079	15,251.92	8,348.28	6,903.64	
158B-U 3	Miles City-Terry	S	Custer	16.421	64,778.56	35,394.56	29,384.00	
District Twelve Subtotal, 1929				40.175	315,843.56	173,519.94	142,323.62	
1930 Program								
135C-U 3	Forsyth-Miles City	S	Rosebud	13.085	43,789.53	24,049.07	19,740.46	
135D-U 3	Forsyth-Miles City	S	Custer	10.462	43,107.96	23,691.89	19,416.07	
157F-U 1	Miles City-Jordan	G	Custer	14.420	55,586.82	31,462.14	24,124.68	
157F-U 2	Miles City-Jordan	B	Custer	0.143	38,369.17	21,716.95	16,652.22	
157D-U 1	Miles City-Jordan	G	Rosebud	14.104	40,119.40	22,707.58	17,411.82	
157D-U 2	Miles City-Jordan	B	Rosebud	0.025	4,808.26	2,721.47	2,086.79	
262B-U 1	Broadus-Wyo. Line	G	Pw. Rv. Carter	16.066	9,259.96		9,259.96	
262A-U 1	Broadus-Wyo. Line	G	Powder River	9.192	45,527.33	25,768.47	19,758.86	
262A-U 2	Broadus-Wyo. Line	B	Powder River	0.164	51,163.09	28,958.31	22,204.78	
156A-U 1	Miles City-Broadus	G	Custer	15.271	66,964.78	37,902.07	29,062.71	
156A-U 2	Miles City-Broadus	B	Custer	0.066	31,062.21	17,581.20	13,481.01	
District Twelve Subtotal, 1930				92.998	429,758.51	236,559.15	193,199.36	
District Twelve—Grand Total				207.381	1,262,889.98	698,597.15	564,292.83	
Grand Totals for Four Years				1,896.397	14,587,747.67	8,237,976.88	5,335,647.47	1,014,123.32

SUMMARY TABLE NO. II.

CONSTRUCTION PROGRAM, 1927, 1928, 1929 AND 1930

Summary for the four years—Since the passage of Initiative Measure No. 31, the State Gasoline Tax, Nov. 2, 1926

Types	1927 Contracts		1928 Contracts		1929 Contracts		1930 Contracts		TOTALS		Average Cost per Mile
	Miles	Amount	Miles	Amount	Miles	Amount	Miles	Amount	Miles	Amount	
Grading	83.114	716,079.24	209.347	1,378,399.19	380.988	2,653,214.73	292.214	1,621,628.35	965.663	6,369,321.51	6,595.80
Grading and Surfacing	189.790	1,657,929.94	57.015	471,219.22	48.644	454,391.61	20.971	208,456.79	316.420	2,791,997.56	8,823.71
Grading and Hard Surfacing	1.026	43,607.34	0.245	14,254.57	0.392	18,195.87	0.547	38,794.65	2.210	114,852.43	51,969.43
Bridges	1.305	432,311.24	1.495	1,057,560.58	2.034	670,932.56	1.530	643,482.16	6.364	2,804,286.54	
Railway Underpasses					2 Units	65,847.32	0.083	52,100.23	0.083	117,947.55	
Sub-totals New Mileage	275.235	2,849,927.76	268.102	2,921,433.56	432.058	3,862,532.09	315.345	2,564,462.18	1,290.740	12,198,405.59	
Surfacing	24.174	75,618.33	79.721	268,297.78	167.496	565,413.31	153.004	515,379.11	424.395	1,424,708.53	3,357.03
Hard Surfacing			8.011	223,383.16					8.011	223,383.16	27,884.55
Regrading			15.581	45,741.26	0.796	5,318.10	2.000	26,490.22	18.377	77,549.58	4,219.93
Resurfacing	7.310	21,780.00	3.230	10,425.10					10.540	32,205.10	3,055.51
Bridge Reconstruction			0.017	10,248.15			0.023	8,959.81	0.040	19,207.96	
Road Betterments		4,363.62								4,363.62	
Construction Oiling					2.563	5,954.71	87.871	267,892.70	90,434	273,847.41	3,028.15
Surfacing and Oiling							41.625	263,397.54	41.625	263,397.54	6,327.87
Regrading and Resurfacing					12,235	70,679.18			12.235	70,679.18	5,776.80
Sub-totals Improving previously graded Mileage	31.484	101,761.95	106.560	558,095.45	183.090	647,365.30	284.523	1,082,119.38	605.657	2,389,342.08	
GRAND TOTALS ALL WORK	306.719	2,951,689.71	374.662	3,479,529.01	615.148	4,509,947.39	599.868	3,646,581.56	1,896.397	14,587,747.67	

CONSTRUCTION CONTRACTS LET—

1927	Road, 47	Bridge, 25	Total, 72
1928	Road, 46	Bridge, 28	Total, 74
1929	Road, 57	Bridge, 32	Total, 89
1930	Road, 52	Bridge, 31	Total, 83
Totals	Road, 202	Bridge, 116	Total, 318

TABLE NO. III.

TABLE SHOWING ALLOTMENTS OF STATE CONSTRUCTION FUNDS FROM GAS TAX TO CONSTRUCTION DISTRICTS FROM MARCH, 1927, TO DECEMBER, 1930, INCLUDING ALL RECEIPTS ESTIMATED TO JUNE 30, 1931

Includes Construction Contracts for 1927, 1928, 1929 & 1930, and Estimated Right of Way Expenditures to June 30, 1931.

CONSTRUCTION DISTRICT		Percentage Fixed Statute	Funds Available and Allotted	FUNDS EXPENDED			Balance †Debit ‡Credit
Number	Counties Included			Right-of-Way Expenditures	Construction Contracts	Total Expended	
1.	Lincoln, Flathead and Lake	8.07	$ 462,897.02	$ 57,633.99	$ 459,418.95	$ 517,052.94	$ 54,155.92†
2.	Glacier, Toole, Liberty, Hill and Blaine	5.65	324,085.27	38,079.67	290,955.97	329,035.64	4,950.37†
3.	Phillips, Valley, Daniels, Sheridan and Roosevelt	7.68	440,526.54	83,948.80	374,702.22	458,651.02	18,124.48†
4.	McCone, Richland, Dawson, Wibaux and Prairie	6.38	365,958.24	41,348.66	340,862.31	382,210.97	16,252.73†
5.	Fergus, Petroleum and Garfield	7.07	405,536.79	68,402.99	334,317.96	402,720.95	2,815.84‡
6.	Pondera, Teton, Chouteau, Cascade and Judith Basin	8.36	479,531.49	63,998.94	457,906.60	521,905.54	42,374.05†
7.	Lewis & Clark, Jefferson and Broadwater	11.44	656,200.98	88,015.96	576,661.40	664,677.36	8,476.38†
8.	Sanders, Mineral, Missoula, Ravalli, Granite and Powell	10.08	578,191.07	132,332.82	602,736.97	735,069.79	156,878.72†
9.	Beaverhead, Deer Lodge, Madison and Silver Bow	8.18	469,206.65	89,031.95	465,623.03	554,654.98	85,448.33†
10.	Park, Gallatin, Sweet Grass, Meagher and Wheatland	7.77	445,688.95	40,511.60	427,315.47	467,827.07	22,138.12†
11.	Golden Valley, Carbon, Musselshell, Stillwater, Big Horn, Yellowstone and Treasure	8.63	495,018.75	59,356.42	440,853.76	500,210.18	5,191.43†
12.	Rosebud, Custer, Fallon, Powder River and Carter	10.69	613,180.80	60,071.07	564,292.83	624,363.90	11,183.10†
	TOTALS	100.00	$5,736,022.55	$822,732.87	$5,335,647.47	$6,158,380.34	$422,357.79†

CONSTRUCTION DISTRICT ALLOTMENTS.

The state construction district law adopted in 1927 prescribes that construction funds allotted to districts shall be distributed in accordance with percentages named in the Act. The detail of allotments in accordance with this provision is shown by Table No. III.

Due to the physical impossibility of obtaining right-of-way and letting contracts so that each district will each year receive its exact amount to the penny it becomes necessary to carry forward each year to the next year, debits or credits for the twelve districts. Where a debit amount is carried forward that district is charged with that amount, and available construction funds for the ensuing year are reduced to that extent. Where a district has a credit carried forward, the available construction funds for the ensuing year are increased by the amount of the credit. The net result of this procedure is that each construction district receives its legally prescribed share of construction funds through the construction program period and is kept in proper balance with the other districts.

Table III includes all funds actually received for construction to June 30, 1930, and estimated to be received to June 30, 1931. Due to the fact that actual receipts in 1930 have been less than estimated, and since it appears that the same will be true of the first six months of 1931, the table shows an estimated deficit of about $422,000.00, which will be existent at the end of the fiscal year of 1931 on June 30, 1931. This will operate to materially decrease construction in 1931 unless additional state funds are in some way provided.

COUNTY COOPERATION

During the past four years nineteen counties, four cities, four railways, and private subscriptions in eleven of the twelve districts have provided over $1,000,000 of funds to be matched with Federal Aid in augmenting construction. Since Montana receives about 56 per cent Federal aid, this more than a million dollars has enabled the matching of $1,290,000 of Federal aid, and has resulted in $2,304,000 more construction than would have been possible without this cooperation. The detail of the cooperation received is shown by following Table No. IV.

TABLE NO. IV.

TABULATION OF LOCAL FUND COOPERATION

In State Highway Commission Construction Program, 1927-1930

Source—	Year	Amount	
District One—			
City of Polson	1927	$ 1,488.78	
Flathead County	1927–28–30	23,000.00	
Great Northern Ry. Co.	1929	30,000.00	
		54,488.78	—Total District One
District Two—			
Hill County*	1928	11,193.60	
Toole County	1930	5,000.00	
		16,193.60	—Total District Two
District Three—			
Roosevelt County	1928	5,000.00	
Valley County	1929	8,048.49	
		13,048.49	—Total District Three
District Four—			
McCone County	1928	10,000.00	
Private Subscriptions	1928	20,000.00	
		30,000.00	—Total District Four
District Five—			
Fergus County	1930	8,563.84	
		8,563.84	—Total District Five
District Six—			
City of Stanford	1927	1,053.85	
City of Great Falls	1927–29	10,726.95	
Cascade County	1927–28–29–30	107,680.34	
Chouteau County	1929	5,000.00	
Great Northern Ry. Co.	1929–30	26,574.99	
		151,036.13	—Total District Six
District Seven—			
Lewis & Clark County	1927–28–29	30,601.21	
Great Northern Ry. Co.	1928	4,612.00	
		35,213.21	—Total District Seven
District Eight—			
Missoula County	1927–28–29	45,000.00	
Mineral County	1927–28–29	43,978.13	
Powell County	1930	50,000.00	
Milwaukee Railway Co.	1929	8,752.75	
		147,730.88	—Total District Eight
District Nine—			
Silver Bow County	1927–28–29–30	326,793.86	
Deer Lodge County	1928–29–30	53,000.00	
Beaverhead County	1929–30	40,000.00	
Railways	1928–29	34,800.00	
		454,593.86	—Total District Nine
District Ten—			
Park County	1927–28–29	60,000.00	
Meagher County	1928	5,000.00	
City of W. Sul. Spgs.	1928	5,000.00	
		70,000.00	—Total District Ten
District Eleven—			
Yellowstone County	1928–29	20,000.00	
Nor. Pac. Ry. Co.	1930	13,254.53	
		33,254.53	—Total District Eleven
GRAND TOTAL		$1,014,123.32	

19 Counties	857,859.47
4 Cities	18,269.58
4 Railways	117,994.27
Private Subscription	20,000.00
GRAND TOTAL	$1,014,123.32

STATE GAS TAX REVENUE

The only state revenue which goes to the state road program is that from the gas tax. The first receipts from the three cent per gallon tax enacted by Initiative Measure No. 31 were collected in March, 1927. The three cent tax continued to and including April, 1929. The 1929 Legislature raised the tax to five cents per gallon effective April 1, 1929, the first receipts being collected in May, 1929.

The Legislature in 1927 enacted a refund law of three cents per gallon to be paid to all consumers of gasoline used for purposes "other than propelling vehicles upon any of the public highways or streets of this state," and the refund was increased in 1929 to five cents per gallon when the tax was increased.

Appropriations have been made since 1927 to the Board of Equalization for expenses incident to the operation of the gasoline tax collection and refund law, and since July 1, 1929, to the State Purchasing Agent for a clerk in his office to handle Highway Commission business and to the State Auditor for a clerk to draw refund warrants.

Table No. V. shows by months from March, 1927, to December, 1930, the gross collections, refund payments (warrants issued), appropriations to other departments, and the net receipts to this department; also totals by six-month periods, calendar and fiscal years and corresponding percentages of the last three named items to the gross receipts.

No comment is necessary to emphasize the almost constantly increasing percentage of refund payments.

In Montana the net revenue collected by the state for motor vehicle license fees is distributed to the counties in which the vehicles are registered, to the credit of the county road funds. Likewise the counties receive the net fees from the automobile title registration and theft fund. During the four fiscal years from 1927 to 1930 the counties received from the license fees $5,230,427.82, and from the auto theft fund $164,177.11, a total of $5,394,604.93. The counties also receive in their road and bridge funds annually amounts collected as a part of the annual property tax and levied for road and bridge purposes.

TABLE NO. V.

TABLE SHOWING GASOLINE TAX COLLECTIONS FROM MARCH, 1927, TO DECEMBER, 1930

Including Gross Collections, Refund Payments, Appropriations of Other Departments, Net Receipts to State Highway Commission, and Percentage of Refunds to Gross Collections.

Year	Month	Rate of Tax	Gross Collections	Refund Payments		Appropriations of Other Departments		Net Collections to State Highway Com.	
				Amount	Pct.	Amount	Pct.	Amount	Pct.
1927	March	Three Cents	90,959.65	....		597.99		90,361.66	
	April	Three Cents	90,416.08	711.79		1,890.03		87,814.26	
	May	Three Cents	133,062.39	1,057.03		2,939.71		129,065.65	
	June	Three Cents	129,149.32	13,307.32		890.76		114,951.24	
Subtotal, Fiscal Year 1927			443,587.44	15,076.14	3.40	6,319.49	1.42	422,192.81	95.18
1927	July	Three Cents	156,465.96	12,050.22		790.45		143,625.29	
	August	Three Cents	185,044.68	22,564.61		1,241.94		161,238.13	
	September	Three Cents	203,078.02	11,961.49		849.94		190,266.59	
	October	Three Cents	210,208.16	17,959.25		1,245.52		191,003.39	
	November	Three Cents	211,956.93	21,479.07		840.06		189,637.80	
	December	Three Cents	120,541.59	34,289.69		611.26		85,640.64	
Subtotal, 6 months			1,087,295.34	120,304.33	11.07	5,579.17	0.51	961,411.84	88.42
Total for Calendar Year 1927			1,530,882.78	135,380.47	8.84	11,897.66	0.78	1,383,604.65	90.38
1928	January	Three Cents	72,479.14	19,699.47		376.11		52,403.56	
	January	Old 2c Tax	5,828.94					5,828.94	
	February	Three Cents	125,987.37	36,460.18		909.13		88,618.06	
	March	Three Cents	78,883.96	8,915.11		808.02		69,160.83	
	April	Three Cents	157,649.60	....		734.23		156,915.37	
	May	Three Cents	175,908.24	5,203.83		665.84		170,038.57	
	June	Three Cents	257,612.20	16,388.83		1,724.36		239,499.01	
Subtotal, 6 months			874,349.45	86,667.42	9.90	5,217.69	0.60	782,464.34	89.50
Total for Fiscal Year 1928			1,961,644.79	206,971.75	10.55	10,796.86	0.55	1,743,876.18	88.90
Total March, 1927, to June, 1928			2,405,232.23	222,047.89	9.23	17,115.35	0.71	2,166,068.99	90.06
1928	July	Three Cents	193,095.00	31,288.77		642,98		161,163.25	
	August	Three Cents	242,970.26	58,048.94		737.12		184,184.20	
	September	Three Cents	275,169.26	23,861.35		865.72		250,442.19	
	October	Three Cents	260,974.09	27,118.02		1.000.50		232,855.57	
	November	Three Cents	204,256.32	11,777.89		759.19		191,719.24	
	December	Three Cents	148,631.97	97,318.37		696.62		50,616.98	
Subtotal, 6 months			1,325,096.90	249,413.34	18.82	4,702.13	0.36	1,070,981.43	80.82
Total, Calendar Year 1928			2,199,446.35	336,080.76	15.28	9,919.82	0.45	1,853,445.77	84.27

Year	Month	Rate of Tax	Gross Collections	Refund Payments		Appropriations of Other Departments		Net Collections to State Highway Com.	
				Amount	Pct.	Amount	Pct.	Amount	Pct.
1929	January	Three Cents	105,028.89	30,332.17		736.61		73,960.11	
	February	Three Cents	93,656.56	107,613.13		580.78		—14,537.35	Deficit
	March	Three Cents	60,871.71	11,004.69		718.18		49,148.84	
	April	Three Cents	194,982.62	5,837.64		1,138.85		188,006.13	
	May	Five Cents	399,559.61	3,488.99		1,740.03		394,330.59	
	June	Five Cents	569,372.60	101,395.52		1,770.53		466,206.55	
Subtotal, 6 months			1,423,471.99	259,672.14	18.25	6,684.98	0.47	1,157,114.87	81.28
Total, Fiscal Year 1929			2,748,568.89	509,085.48	18.52	11.387.11	0.41	2,228,096.30	81.07
1929	July	Five Cents	409,146.83	125.00		2,914.20		406,107.63	
	August	Five Cents	407,064.06	207,942.71		2.841.65		196,279.70	
	September	Five Cents	563,026.79	42,518.02		1,876.13		518,632.64	
	October	Five Cents	390,269.12	209,200.99		2,330.50		178,737.63	
	November	Five Cents	341,538.58	145,005.05		1,896.75		194,636.78	
	December	Five Cents	233,328.51	99,635.16		1,724.19		131,969.16	
Subtotal, 6 months			2,344,373.89	704,426.93	30.05	13,583.42	0.58	1,626,363.54	69.37
Total, Calendar Year 1929			3,767,845.88	964,099.07	25.59	20,268.40	0.54	2,783,478.41	73.87
1930	January	Five Cents	152,713.93	58,716.96		2,024.92		91,972.05	
	February	Five Cents	122,833.75	19,979.58		1,778.88		101,075.29	
	March	Five Cents	174,044.70	39,332.31		1,693.14		133,019.25	
	April	Five Cents	230,219.44	16,582.22		1,919.79		211,717.43	
	May	Five Cents	499,995.41	20,464.94		2,136.86		477,393.61	
	June	Five Cents	438,894.03	101,821.59		2,517.76		334,554.68	
Subtotal, 6 months			1,618,701.26	256,897.60	15.87	12,071.35	0.75	1,349,732.31	83.38
Total. Fiscal Year 1930			3,963,075.15	961,324.53	24.26	25,654.77	0.65	2,976,095.85	75.09
1930	July	Five Cents	412,866.85	136,756.08		1,556.58		274,554.19	
	August	Five Cents	421,816.53	82,302.18		1,885.68		337,628.67	
	September	Five Cents	524,317.57	78,063.43		1,808.12		444,446.02	
	October	Five Cents	368,496.03	139,619.61		1,827.63		227,048.79	
	November	Five Cents	292,164.21	145,511.77		1,812.86		144,839.58	
	December (Est.)	Five Cents	240,000.00	91,742.78		1,850.00		146,407.22	
Subtotal, 6 months			2,259,661.19	673,995.85	29.83	10,740.87	0.47	1,574,924.47	69.70
Total, Calendar Year 1930			3,878,362.45	930,893.45	24.00	22,812.22	0.59	2,924,656.78	75.41
GRAND TOTALS			11,376,537.46	2,366,453.75	20.81	64,898.10	0.57	8,945,185.61	78.62

SUMMARY TABLE V.

Year Month	Rate of Tax	Gross Collections	Refund Payments		Appropriations of Other Departments		Net Collections to State Highway Com.	
			Amount	Pct.	Amount	Pct.	Amount	Pct.
By Calendar Years—								
March to Dec., 1927 (10 mos.)	3c	1,530,882.78	135,380.47	8.84	11,897.66	0.78	1,383,604.65	90.38
January to December, 1928	3c	2,199,446.35	336,080.76	15.28	9,919.82	0.45	1,853,445.77	84.27
January to December, 1929	3c & 5c	3,767,845.88	964,099.07	25.59	20,268.40	0.54	2,783,478.41	73.87
January to December, 1930	5c	3,878,362.45	930,893.45	24.00	22,812.22	0.59	2,924,656.78	75.41
GRAND TOTALS		11,376,537.46	2,366,453.75	20.81	64,898.10	0.57	8,945,185.61	78.62
By Fiscal Years—								
March to June, 1927 (4 mos.)	3c	443,587.44	15,076.14	3.40	6,318.49	1.42	422,192.81	95.18
July, 1927, to June, 1928	3c	1,961,644.79	206,971.75	10.55	10,796.86	0.55	1,743,876.18	88.90
July, 1928, to June, 1929	3c & 5c	2,748,568.89	509,085.48	18.52	11,387.11	0.41	2,228,096.30	81.07
July, 1929, to June, 1930	5c	3,963,075.15	961,324.53	24.26	25,654.77	0.65	2,976,095.85	75.09
July to December, 1930 (6 mos.)	5c	2,259,661.19	673,995.85	29.83	10,740.87	0.47	1,574,924.47	69.70
GRAND TOTALS		11,376,537.46	2,866,453.75	20.81	64,898.10	0.57	8,945,185.61	78.62
By Rate of Tax—								
March, 1927 to April, 1929	3c	4,184,868.91	626,248.86	14.97	24,991.90	0.60	3,533,628.15	84.43
May, 1929, to December, 1930	5c	7,191,668.55	1,740,204.89	24.20	39,906.20	0.55	5,411,557.46	75.25
GRAND TOTALS		11,376,537.46	2,366,453.75	20.81	64,898.10	0.57	8,945,185.61	73.62

RECEIPTS AND EXPENDITURES

The analysis of receipts and expenditures from March, 1927, to June, 1930, is as follows, as shown by the accounting records of this department reconciled each month and fiscal year with other state departments:

TABLE NO. VI.

Table Showing Receipts, Expenditures and Overhead Percentage,

From March 1, 1927, when 3c gas tax receipts began, to the close of the Fiscal Year 1930 on June 30, 1930.

RECEIPTS

Balance on hand March 1, 1927		$ 163,487.09
Receipts during period:		
From United States for Federal Aid construction	$6,417,629.05	
From counties, etc., for Federal Aid construction	808,760.13	
Net gasoline tax receipts	7,370,261.14	
Oil royalties from United States	78,955.45	
Refund of cash for Court Bond	6,000.00	
Miscellaneous Receipts	14,526.20	
Total Receipts for period		$14,696,131.97
Grand Total Receipts		$14,859,619.06

EXPENDITURES

Operative Items

Construction—	Amount	Totals	Pct.
Payments to contractors	$11,059,805.73		72.65
Payments for Right of Way	582,732.87		3.83
Federal Aid Construction Supervision	318,257.69		2.09
Signing Highways	28,108.84		0.19
Total Construction		$11,988,905.13	78.76
Maintenance		1,763,884.29	11.59
Capital Outlay—			
Office and engineering equipment	$ 12,666.79		0.08
Mobile and Maintenance Equipment	525,450.70		3.45
Mobile and Maintenance Stores	12,108.85		0.08
Office stores	2,226.33		0.01
Maintenance Equipment Shops	20,948.36		0.14
Cash Paid out for court bonds	6,000.00		0.04
Total Capital Outlay		$ 579,401.03	3.80
County refunds of funds overpaid to match Federal Aid		2,316.05	0.02
Grand Total Operative Expenditures		$14,334,506.50	94.17

Overhead Items

	Amount	Totals	Pct.
Commission Administration	$ 9,917.39		0.06
Department Administration	246,496.62		1.62
Preconstruction Engineering	321,686.36		2.11
State Construction Supervision	260,392.66		1.71
Maintenance Supervision	41,879.73		0.28
Missouri River Bridge Site Investigation	7,634.14		0.05
Grand Total Overhead Expenditures		$ 888,006.90	5.83
GRAND TOTAL ALL EXPENDITURES		$15,222,513.40	100.00

The three cent gasoline tax initiative measure and subsequent legislation has all provided that the "overhead" expenditures for any fiscal year shall not exceed eight per cent (8%) of the total of all funds expended for that year. It will be observed that the overhead percentage for the period from March, 1927, to June, 1930, inclusive, has been 5.83 per cent. By single fiscal periods the overhead percentage has been as follows:

March, 1927, to June, 1928	6.77%
July, 1928, to June, 1929	5.42%
July, 1929, to June, 1930	5.48%
July, 1930, to November, 1930	4.64%

The cost of the present three man per diem commission from March, 1927, to June, 1930, a period of forty months, has been $9,917.39, or about $247.93 per month. This has been six one hundredths of one per cent of the total expenditures, or in other words every one hundred dollars expended has included only six cents chargeable directly to the Commission. This averages about $82.50 per month for each of the three members, including an average of $20 for per diem, the remaining amounts having been expended mainly for transportation from homes to monthly meetings and for expenses incident thereto.

RIGHT OF WAY

Since October, 1927, and in compliance with a Supreme Court decision handed down in that month, this department has secured by purchase or condemnation all rights of way required for the construction of projects on the Federal Highway System. The amount expended from October, 1927, to June, 1930, has been $582,732.87, and in accordance with the Supreme Court decision this has been charged to the twelve construction districts in which expended and as a part of the construction cost to the state. No federal aid is obtainable for right of way expenditures.

Table No. VII. below details the disbursements for right of way from October, 1927, to June, 1930, and shows average costs for land and fencing, the two major items.

TABLE NO. VII.

Distribution of Right-of-Way Expenditures from October, 1927, to June, 1930

Item		Percentage of Total	Amount
Purchase of Land		39.38	$229,476.38
Number of Acres of country property	6.563 Acres		
Average Price Paid Per Acre	$ 34.40		
Number of Acres of City Property	7.322 Acres		
Average Price Paid Per Acre	$261.95		
Number of City Lots Bought	30 Lots		
Average Price Per Lot	$ 59.98		
Damage Paid for Segregation, etc.		10.91	63,597.25
Payments for moving buildings, building wells and miscellaneous damages		3.29	19,167.10
Payments for building new fences		26.85	156,433.60
Number of rods	198.383 Rods		
Average price per rod	$ 0.7885		
Payments for Moving fences		2.56	14,894.66
Number of Rods	37,971 Rods		
Average cost per rod	$ 0.3923		
Condemnation of Land		9.26	53,932.89
Number of acres condemned	244.85 Acres		
Average cost per acre, including land, fencing, damage and all other charges	$220.27		
Purchase of Gravel Pits		0.09	542.55
Sub-total		92.34	538,044.43
All Salaries & Expenses for procuring Right of Way		7.66	44,688.44
GRAND TOTAL		100.00	$582,732.87

FEDERAL HIGHWAY SYSTEM

The table following (No. VIII.) gives a description by routes of the Montana Federal Highway System as now approved.

TABLE NO. VIII.

MONTANA FEDERAL AID HIGHWAY SYSTEM

As Approved By
U. S. SECRETARY OF AGRICULTURE
To December, 1930

	Gross Lengths	Indian Reservations	Forest & Other Federal Reserves	Net Length
Route 1. From the Montana-Idaho line near Leonia via Troy, Kalispell, Browning, Cut Bank, Shelby, Havre, Poplar, Culbertson and Bainville to the North Dakota line between Bainville and Williston, approved October 9, 1922	718.00	175.42	114.69	427.89
Route 2. From the Montana-Idaho line at Lookout Pass via St. Regis, Missoula, Garrison, Butte, Whitehall, Three Forks, Bozeman, Livingston, Laurel, Billings, Miles City, and Baker to the Montana-North Dakota line between Baker and Bowman, approved October 9, 1922	777.00	....	49.50	727.50
Route 3. From the Montana-Idaho line at Pleasant Valley Pass via Monida, Dillon, Butte, Boulder, Helena, Wolf Creek, Great Falls, Choteau and Browning to the Montana-Canadian line, approved October 9, 1922	452.00	65.40	12.00	374.60
Route 4. From Laurel via Bridger to the Montana-Wyoming line near Frannie, approved October 9, 1922	56.00	....	....	56.00
Route 5. From Missoula via Ravalli, Polson, Kalispell and Eureka to the United States-Canadian boundary line near Gateway, approved May 3, 1924	209.00	84.50	23.00	101.50
Route 6. From Ravalli via Thompson Falls to the Montana-Idaho line near Heron, approved October 9, 1922	125.00	28.00	18.00	79.00
Route 7. From Missoula via Hamilton to the Montana-Idaho line at Gibbons Pass, approved October 9, 1922	108.00	....	20.54	87.46
Route 8. From Garrison via Helena and Townsend to Three Forks, approved October 9, 1922	121.00	....	9.00	112.00
Route 9. From Wolf Creek via Augusta to Choteau, approved October 9, 1922	65.00	....	....	65.00
Route 10. From Great Falls via Fort Benton to Havre, approved October 9, 1922	118.00	....	....	118.00
Route 11. From Great Falls via Armington, White Sulphur Springs and Livingston to the Yellowstone Park line at Gardiner, approved October 9, 1922	225.00	....	57.00	168.00
Route 12. From the Yellowstone Park line at Yellowstone to the Montana-Idaho line, approved October 9, 1922	10.00	....	9.61	0.39
Route 13. From West Yellowstone via Madison Canyon, Lyon, Ennis and Norris to a point on the Federal Aid Road near Sappington, approved August 6, 1929	110.00	....	31.00	79.00
Route 14. From Townsend via White Sulphur Springs, Harlowton, Ryegate and Roundup to a point on the Federal Aid Road at or near Forsyth, approved May 6, 1930	281.80	....	9.00	272.80
Route 15. From Armington via Lewistown, Grass Range, Jordan, Circle, Glendive, Wibaux to the Montana-North Dakota line near Beach, approved October 9, 1922	414.00	....	....	414.00

	Gross Lengths	Indian Reservations	Forest & Other Federal Reserves	Net Length
Route 16. From Grass Range via Roundup, Billings and Hardin to the Montana-Wyoming line near Parkman, approved October 9, 1922	206.00	57.86	....	148.14
Route 17. From Miles City to Glendive, approved October 9, 1922	80.00	....	....	80.00
Route 18. From Jordan to Miles City, approved October 9, 1922	70.00	....	....	70.00
Route 19. From a point on the Federal Aid Road between Garrison and Butte via Anaconda, Philipsburg to Drummond, approved May 3, 1924	66.00	....	17.50	48.50
Route 20. From Glendive via Sidney to Fairview, approved September 27, 1923	65.00	....	....	65.00
Route 21. From Vaughn via Conrad and Shelby to the United States-Canadian boundary near Sweet Grass, approved May 3, 1924	112.00	....	....	112.00
Route 22. From Culbertson via Plentywood to Scobey, approved May 3; 1924	97.00	6.40	....	90.60
Route 23. From Miles City via Broadus to the Wyoming line near Alzada, approved May 12, 1927	154.00	....	....	154.00
Route 24. From Bonner via Ovando, Lincoln, Augusta and Sun River to Langes Corner, approved May 8, 1926	155.00	....	6.50	148.50
Route 25. From a point on the Federal Aid Road at or near Wolf Point to Circle, approved May 6, 1930	55.50	5.90	....	49.60
Route 26. From a point on the Federal Aid Road near Sidney to the North Dakota line, approved March 6, 1930	10.00	....	....	10.00
Route 27. From Baker to Ekalaka, approved May 6, 1930	37.60	....	....	37.60
Route 28. From a point on the Federal Aid Road at or near Rockvale to Red Lodge, approved May 6, 1930	32.00	....	....	32.00
Route 29. From a point on the Federal Aid Road at or near Ennis to Virginia City, approved May 6, 1930	14.80	....	....	14.80
Route 30. From a point on the Federal Aid Road at or near Plentywood to the Montana-North Dakota line near Westby, approved May 6, 1930	29.00	....	....	29.00
Route 31. From Flaxville to the International Boundary north of Flaxville enroute to Bengough, Saskatchewan, approved June 7, 1930	13.50	....	....	13.50
Route 32. From Scobey to a point on the Federal Aid Road at or near Wolf Point, approved June 7, 1930	51.00	39.00	....	12.00
Route 33. From a point on the Federal Aid Road at or near Eureka via Rexford to Libby, approved June 7, 1930	62.50	....	49.50	13.00
Route 34. From a point on the Federal Aid Road at or near Manicke to a point on the Federal Aid Road at or near Trout Creek, approved June 7, 1930	27.30	....	24.00	3.30
TOTALS	5128.00	462.48	450.84	4214.68

The total officially approved length of the Federal Highway System is 5,128.00 miles, which is reduced to an actual net mileage of 4,944.48, as explained above in this report.

The allowable mileage in Montana under the seven per cent provision of the Federal Highway Act approved November 9, 1921, is 4,697 miles, exclusive of mileage within Indian Reservations and National Forests or other Federal reserves. The exclusive net length now approved is 4,214.68 miles as shown above.

There were no material changes in the Federal Highway System as it existed in 1926 until this past year, when the U. S. Secretary of Agriculture approved the extension of Route 14 from Roundup to Forsyth, the extension of Route 25 from the Wolf Point bridge across the Missouri river to Circle, and the addition to the System of Routes 26 to 34, inclusive, all in accordance with recommendations made in 1929 by the Highway Commission.

Three other recommendations for additions to the Federal Highway System made in 1929 by the Commission have not yet been favorably acted upon by the Secretary of Agriculture, namely:

The Wild Horse Trail from Havre to the Canadian boundary in Hill County, 35 miles.

The Skalkaho road between Hamilton and Georgetown Lake in Ravalli, Granite and Deer Lodge counties, 50 miles.

A road running north and south in the central part of Montana connecting Routes Nos. 1 and 15, and including a crossing of the Missouri river, 100 miles.

It is estimated that in the improvement thus far accomplished on our Federal Highway System two hundred miles of distance has been saved by the relocation and straightening out of highways by Federal Aid construction. That is to say, the state construction on improved routes is in the aggregate two hundred miles less in length than were the former county roads and trails following the same general routes. The saving in money due to this saving and shortening of distance is very considerable and is three-fold. There is first the saving in cost of construction, which averages for a graded and gravel surfaced road between eleven and twelve thousand dollars per mile. Second, there is the perpetual saving of maintenance of two hundred miles of highway, which costs at present about $215 per mile per annum, and which is constantly growing as traffic increases. The third and largest item is the saving to the public in the operating cost of vehicles using the roads. At an average operating cost of ten cents per mile and taking an average of five hundred vehicles per day using the road, the daily saving to the public, on account of the two hundred miles of road shortening already accomplished, is $10,000 per days, or $3,650,000 per year.

MAINTENANCE

It is a fundamental economic maxim that highways and bridges once built must be taken care of and conserved, that is, maintained. The Federal Highway Act recognized this principle, but laid the entire burden of maintenance upon the states, by providing that all Federal Aid construction must be thereafter perpetually maintained by the states with state funds exclusively. Representatives of the Bureau of Public Roads make at least semi-annual inspections of all completed Federal Aid projects to insure that the government moneys invested are being adequately and properly conserved. A duty is thus imposed upon this department which is further and properly emphasized by the obligation to preserve the state's share of the large sums invested in our road and bridge improvements.

In carrying on this important function of maintenance sums have been expended as follows:

Period	Maintenance Expenditures	Total State Revenue	Maintenance Per Cent
March, 1927 to June, 1928	$ 492,353.77	$ 2,166,068.99	22.73
July, 1928, to June, 1929	535,737.96	2,228,096.30	24.04
July, 1929, to June, 1930	777,672.29	2,976,095.85	26.13
July, 1930, to June, 1931 (estimate)	1,015,000.00	$ 3,150,000.00	32.22
TOTALS	$2,820,764.02	$10,520,261.14	26.81*

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* Average

The above expenditures include general surface maintenance, which is costing an average of about $215 per mile per year now, but will rapidly increase as traffic density increases; resurfacing, reshaping and reconstruction, bridge repairs, maintenance oiling, snow removal, equipment shops, and other similar items.

In addition to the expenditures for maintenance operations it has been necessary to purchase maintenance equipment to date in the aggregate amount of approximately $700,000.00, about seven per cent of the total receipts from the gasoline tax as shown above.

It will be noted that the percentage of total receipts required for maintenance has constantly increased, and that for the present fiscal year it is about thirty-nine per cent of the total receipts, including operations and equipment. This is natural and to be expected. As the state progresses in the road-building program, traffic density increases. Furthermore the cost of maintaining newly completed roads each year is more than absorbing any annual increase in revenue, thus showing an increased percentage for maintenance requirements and a decreased amount for construction.

ROAD OILING

The Highway Commission has adopted the policy of placing an asphaltic oiled wearing surface on all gravelled highways under its supervision, where traffic averages five hundred or more vehicles per day. This work will be carried forward as rapidly as funds can be spared for the purpose.

Oiling eliminates dust, which is a nuisance and an actual hazard to traffic. It also protects the gravel surface from wear and loss from wind and erosion. It is estimated that a ¾-inch layer of gravel is lost each year where the traffic average about 500 vehicles per day. Where the traffic is greater the loss increases proportionately.

Since 1927 the State Highway Commission has completed or placed under contract a total of 246 miles of oiled surface. This total includes surfaces of three types, viz. "light penetration" 25 miles, "light penetration with armor coat" 34 miles, and "road mix" 187 miles.

"Light Penetration" surface consists of spreading about one and one-half gallons of light asphaltic oil over the surface of a smooth and well compacted gravel road. This is allowed to stand and penetrate for about one day and is then covered with fine gravel and traffic is allowed upon it.

"Light Penetration with Armor Coat" consists of placing a light penetration surface as described, and following up with about one-half gallon per square yard of heavy asphaltic oil. This is covered with stone chips or fine screened gravel.

"Road-mix" consists of mixing asphaltic oil with the crushed rock or gravel on the road by means of blade graders and harrows until each particle of rock is thoroughly coated with oil. This windrow of oil mixed gravel or rock is then spread out smoothly over the road surface. One and one-half gallons of asphaltic road oil per sq. yd. when properly mixed and spread makes an oiled surface about 3 inches thick and 18 feet wide.

The costs of the different types of oiled surface varies from about five hundred dollars per mile for "light penetration" to twenty-four hundred dollars per mile for "road-mix".

It is the plan of the Highway Commission to complete approximately three hundred additional miles of oiled surface in 1931, and corresponding amounts in succeeding years, if sufficient funds are available.

SNOW REMOVAL

Snow Removal is becoming a highly important item in highway transport. The free and dependable movement of traffic between commercial and trade centers during the winter period is a great help to business. In some states systematic and practically complete snow removal has brought it about so that the volume of winter travel is as great as was that of summer travel a few years ago. Manifestly Montana cannot take on this task, except in a limited way, until construction and summer maintenance are somewhat farther advanced than is the case at the present time.

During the year 1930 there has been expended for snow fence about $60,000 and with this amount 240,000 feet have been erected.

The state owns at the present time five rotary snow plows, and other snow removal equipment that has cost about $12,000. The maintenance budget for the present fiscal year includes $40,000 for snow removal operations.

The policy will be to purchase snow removal machinery for each district as rapidly as revenue can reasonably be used for this purpose.

TRAFFIC CENSUS

In order to obtain information as to the amount of traffic using the various routes of the Federal Highway System, monthly traffic counts are taken at about one hundred and fifty designated stations during the summer months. These counts are taken by regular maintenance employes without extra expense, and are of great value in determining the standard of road surface required to adequately serve traffic. The volume of traffic is also an important and often the determining factor in deciding upon priority of construction. The keynote of economic use of highway revenues is the arranging of road systems and the building of the same so that, with the least possible expenditure, the greatest volume of traffic is accommodated.

Table IX. below shows for each traffic count station the average daily traffic as counted for each month, the average for 1930 and the average count for 1929.

TABLE NO. IX.

MONTANA TRAFFIC CENSUS—1930

	June	July	Aug.	Sept.	1930	1929
					Average	
BEAVERHEAD—						
F. A. P. 241-A, North of Dillon	223	271	214	308	252	119
Dillon-Monida	537	594	514	631	569	......
BIG HORN—						
Wyola (Montana-Wyoming line)	250	300	298	239	272	226
Big Horn R. Bridge, South of Hardin	644	748	786	520	675	625
BLAINE—						
One mile West of Chinook	510	492	469	392	466	511
BROADWATER—						
Jefferson R. Bridge, 2 Mi. No. of Three Forks	142	162	152	112	142	......
CARBON—						
One mile south of Roberts	476	369	444	494	446	595
Jct. at Rockvalle to Fromberg	325	339	353	355	343	478
Jct. at Rockvalle to Laurel	564	585	554	569	568	765
Jct. at Rockvalle to Red Lodge	239	246	201	214	225	289
CASCADE—						
Jct. at Armington to Neihart	303	300	172	106	219	219
Jct. at Armington to Belt	501	300	264	187	313	340
Jct. at Armington to Lewistown	196	90	88	68	111	149
One mile S. E. of Great Falls on Belt Road	904	1068	780	1262	1004	3762
Jct. at Sun River to Great Falls	456	658	561	328	501	599
Jct. at Sun River to Choteau	223	353	315	178	267	283
Jct. at Sun River to Simms	262	344	268	172	262	344
One mile north of Vaughn to Shelby	240	254	200	97	198	244
One mile west of Great Falls to Cascade	734	646	640	550	643	688
1½ miles N. W. of Great Falls to Vaughn	1025	1185	1146	986	1086	1493
Four miles west of Belt to Great Falls	451	610	551	371	496	360
Kings' Hill Neihart W. S. Springs Road	88	126	131	52	99	......
CHOUTEAU—						
Tunis-Great Falls-Fort Benton Road	....	......	165	47	106	......
CUSTER—						
One mile east of Miles City to Miles City	893	831	709	666	775	658
One mile east of Miles City to Terry	711	688	557	524	621	506
One mile east of Miles City to Ismay	199	143	165	72	145	171
Two miles N. W. of Miles City M. C. Jordan R.			496	184	340	......
DANIELS—						
One mile east of Scobey to Plentywood	307	415	328	262	328	263
DAWSON—						
1½ miles N. of Yellowstone Bridge to Sidney	599	676	656	507	610	533
One mile east of Glendive to Wibaux	863	408	343	458	518	431
One-fourth mile west of Glendive		11465	986	619	1023	......

	June	July	Aug.	Sept.	1930 Average	1929 Average
DEER LODGE—						
Jct. 17 miles W. of Butte to Deer Lodge	632	834	825	609	725	696
Jct. 17 miles W. of Butte to Butte	1718	2152	2109	1575	1889	......
Jct. 17 miles W. of Butte to Anaconda	2010	2759	2738	2057	2391	2077
FALLON—						
One mile east of Baker	318	236	236	204	249	287
One mile south of Baker	344	313	333	274	316	335
FERGUS—						
South of Jct. at Grass Range	124	116	122	96	115	218
West of Jct. at Grass Range	95	110	119	67	98	150
East of Jct. at Grass Range	82	71	70	61	71	119
One mile east of Lewistown	468	633	519	381	500	480
One mile west of Lewistown	543	810	888	610	712	808
Jct. one mile N. of Lewistown to Lewistown	565	627	662	418	568	681
Jct. one mile N. of Lewistown to Roy	358	435	386	143	331	468
Jct. one mile N. of Lewistown to Hanover	208	245	251	284	247	215
FLATHEAD—						
F. A. P. 58-D West of Kalispell	313	457	......	280	350	281
Jct. 4 miles W. of Whitefish to Kalispell	341	382	......	290	338	384
Jct. 4 miles W. of Whitefish to Whitefish	579	687	......	491	586	602
Jct. 4 miles W. of Whitefish to Columbia Falls	252	319	......	215	262	255
One miles S. of Kalispell to Sommers	573	868	......	550	664	704
Jct. 6 miles E. of Kalispell to Kalispell	491	803	......	544	613	490
Jct. 6 miles E. of Kalispell to Belton	295	458	......	321	358	286
Jct. 6 miles E. of Kalispell to Polson	200	261	......	239	233	214
Five miles east of Olney	....	247	......	137	192	239
Columbia Falls-Glacier Park Road	203	509	......	178	297	188
Lupfer-Whitefish-Eureka Road	195	......	......	......	195	......
GALLATIN—						
One mile east of Three Forks	567	706	......	355	543	615
Three miles west of Bozeman	944	1244	......	940	1043	1121
One mile east of Bozeman	696	782	......	614	697	668
One mile west of Huffine Lane	1228	1319	1071	1105	1181	1009
State Camp on West Gallatin	143	151	169	51	129	124
West Yellowstone-Targhee Pass	562	680	......	139	460	......
GARFIELD—						
F. A. P. 157-B 7.5 miles south of Jordan	43	42	59	60	51	55
GLACIER—						
Wye east of Browning to Browning	424	560	543	......	509	225
Wye east of Browning to Great Falls	244	322	299	......	288	137
Wye east of Browning to Shelby	238	296	278	......	271	158
Two miles east of Cut Bank	325	367	331	281	326	......
Summit at Glacier County Line	....	233	......	81	157	......
GRANITE—						
Jct. at Drummond to Philipsburg	382	497	542	441	466	287
Jct. at Drummond to Garrison	881	730	703	549	716	556
Jct. at Drummond to Missoula	765	747	690	563	691	490
Skalkaho Jct. to Philipsburg	253	420	342	247	316	346
Skalkaho Jct. to Hamilton	80	182	101	62	106	93
Skalkaho Jct. to Anaconda	270	371	361	226	307	333
HILL—						
One mile west of Havre	645	691	676	450	616	739
One mile south of Havre	438	475	375	296	396	408
JEFFERSON—						
Jct. 6 miles W. of Willow Creek to Harrison	34	76	53	62	56	......
Jct. 6 miles W. of Willow Creek on U. S. 10	295	393	379	224	323	......
Top Woodville Hill on U. S. 91	663	703	595	401	591	558
LAKE—						
Jct. one mile S. of Polson to Polson	502	793	655	560	628	571
Jct. one mile S. of Polson to Missoula	356	571	462	383	443	433
Jct. one mile S. of Polson to E. Shore	213	346	293	249	275	205
One mile north of Polson	294	369	328	194	296	296
Ravalli Jct. to Polson	303	387	328	286	326	306
Ravalli Jct. to Missoula	385	485	424	321	404	382
Ravalli Jct. to Paradise	143	209	189	165	177	194
LEWIS AND CLARK—						
One mile east of East Helena	....	497	494	445	479	379
Jct. one mile east of Helena to Helena	....	1611	1518	1171	1433	1437
Jct. one mile east of Helena to Boulder	....	572	465	267	435	358
Jct. one mile east of Helena to East Helena	....	1027	1059	893	993	1008
Five miles south of Dearborn Bridge	217	241	177	105	185	274

	June	July	Aug.	Sept.	1930 Average	1929 Average
LINCOLN—						
Six miles west of Libby	127	110	......	95	111	68
Warland-Libby-Rexford Road	62	66	......	65	64	47
Elk Hill F. A. P. No. 58-C	61	97	......	45	68	41
MADISON—						
North of Ennis on F. A. P. No. 171	137	215	195	160	177	219
Ennis-Virginia City	111	184	108	47	113	106
MEAGHER—						
Jct. one mile E. of W. S. Spgs. to W. S. Spgs.	127	124	104	101	114	183
Jct. one mile E. of W. S. Spgs. to Great Falls	68	85	80	47	70	122
Jct. one mile E. of W. S. Spgs. to Harlowton	62	40	43	60	51	61
MINERAL—						
Taft Yellowstone Trail	351	361	398	158	317	333
MISSOULA—						
Jct. N. of Missoula to Wallace	718	724	671	621	684	776
Jct. N. of Missoula to Missoula	1386	1402	1237	1087	1278	1420
Jct. N. of Missoula to Ravalli	687	698	565	457	602	561
Blk. Foot Jct. at Bonner to Missoula	1073	1161	1738	756	1032	1079
Blk. Foot Jct. at Bonner to Butte	631	692	739	473	434	728
Blk. Foot Jct. at Bonner to Lincoln	587	603	559	416	541	503
Lolo Jct. to Missoula	498	574	600	548	555	507
Lolo Jct. to Hamilton	464	502	520	470	489	446
Lolo Jct. to Lolo Hot Springs	219	213	192	126	187	184
MUSSELSHELL—						
North of Roundup	219	262	253	198	932	233
PARK—						
Jct. east of Livingston to Livingston	732	732	615	435	629	647
Jct. east of Livingston to Great Falls	453	455	387	238	383	391
Jct. east of Livingston to Big Timber	327	307	255	217	277	321
One mile S. of Livingston to Gardiner	976	1156	835	593	890	918
One mile north of Wilsall	155	192	159	87	148	326
PHILLIPS—						
One mile east of Dodson	269	371	205	175	255	514
POWDER RIVER—						
One mile north of Broadus	102	130	109	126	117	92
POWELL—						
Jct. at Garrison to Helena	211	200	219	320	238	181
Jct. at Garrison to Butte	516	376	319	398	402	290
Jct. at Garrison to Drummond	543	389	336	434	426	326
PRAIRIE—						
Jct. E. of Fallon to Miles City	370	370	322	263	331	412
Jct. E. of Fallon to Glendive	317	273	254	188	258	539
Jct. E. of Fallon to Baker	77	123	142	116	115	128
RAVALLI—						
Jct. 3 miles S. of Hamilton to Hamlit	225	264	163	250	251	......
Jct. 3 miles S. of Hamilton to Darby	118	252	208	204	196	......
Jct. 3 miles S. of Hamilton to Skalk	79	80	64	47	68	......
ROOSEVELT—						
Jct. one-half mile W. of Poplar to Poplar	590	828	347	637	601	581
Jct. one-half mile W. of Poplar to Wolf Point	567	558	339	590	514	511
Jct. ½ mile W. of Poplar to Ferry (Co. Ro.)	102	151	87	111	113	93
Six miles E. of Poplar to Poplar	351	353	430	408	386	361
Six miles E. of Poplar to Culbertson	308	277	327	368	420	313
Six miles E. of Poplar to Co. Rd. N. Flaxville	55	92	168	84	100	61
One mile N. Culbertson F. A. P. No. 193-A	135	201	195	593	281	233
Jct. 2 miles E. of Wolf Point to Poplar	281	250	266	204	250	288
Jct. 2 miles E. of Wolf Point to Wolf Point	335	389	435	297	364	397
Jct. 2 miles E. of Wolf Point to Scobey	91	137	172	95	124	131
Jct. at Snowden to Bainville	84	80	101	114	95	63
Jct. at Snowden to Fort Union	76	76	94	86	83	55
Jct. at Snowden to R. R. Toll Bridge	82	49	89	84	76	58
Miss. R. Bridge Wolf Point Circle	215	309	250	228	251	......
ROSEBUD—						
One mile east of Forsyth	456	562	446	395	465	392
SANDERS—						
One mile east of Noxon	102	112	162	107	121	127
Two miles west of Plains	118	146	173	134	143	151

					1930	1929
	June	July	Aug.	Sept.	Average	
SILVER BOW—						
Jct. 5 miles west of Butte to Anaconda	1900	2218	1955	1568	1910	1855
Jct. 5 miles west of Butte to Butte	2232	2688	2211	1861	2248	2134
Jct. 5 miles west of Butte to Dillon	505	572	376	353	452	342
Five miles south of Butte to Whitehall	2578	2472	2397	1542	2247	2321
STILLWATER—						
One-half mile east of Park City	557	764	728	622	668	429
SWEET GRASS—						
Four miles east of Big Timber	411	435	383	257	372	443
TETON—						
One mile north of Choteau	695	857	744	602	725	......
TOOLE—						
One mile east of Shelby	316	402	478	197	348	467
One mile north of Shelby	387	473	577	292	432	550
VALLEY—						
Seven miles west of Frazier	201	203	201	138	186	172
One mile west of Glasgow	390	329	297	200	304	376
WHEATLAND—						
Shawmut-Harlowton-Ryegate Section	....	......	95	76	......	......
YELLOWSTONE—						
One mile west of Billings, Underpass	2258	2253	1776	1866	2038	1852
Yellowstone bridge south of Billings	717	904	755	688	766	789
Jct. east of Billings to Billings	880	1101	969	883	958	759
Jct. east of Billings to Huntley	680	824	717	642	716	722
Jct. east of Billings to Roundup	203	277	252	243	244	199

HIGHWAY MARKINGS

During the biennium covered by this report, the placing of standard warning signs and route numbering signs has been practically completed on all the U. S. numbered highway system in Montana. These signs are the same as those used in other states, and markings are in accordance with regulations of the American Association of State Highway officials.

During the year 1931, other highways on the Federal Aid System but not on the U. S. numbered system will be marked. Standard warning signs will be used, but a State Highway number will be substituted for the U. S. route number, and instead of the regulation U. S. shield a special state marker has been designed. This marker will be of steel, and will show the state route number and the word "Montana".

Agreements have been made with neighboring states so that highways on the Federal Aid System, which cross the state boundaries, will bear the same number in Montana as in other states. This has been found to be a great convenience to travelers, since it enable them to follow the same route number to their destinations even though they pass through several states.

HIGHWAY SITUATION AS TO FINANCES

An outline of the highway situation in Montana would hardly be complete without reference to the government funds which are now available to this state for co-operative construction. The Seventy-first Congress, which adjourned in the fall of 1930 made more liberal authorization for road building than was ever supplied for this purpose in any previous session. The amount of regular Federal Aid was increased to $125,000,000 per year up to 1933. Further, the Federal Highway Act was amended so that authorization in the future would be possible under two other separate methods of allotment. One for construction in the National Forests and one for building across unappropriated public lands and Indian Reservations. Then the authorization for the National Forests was increased to $12,500,000 per year. A stated authorization for the unappropriated public lands and Indian reservations did not get through the Seventy-first Congress, and so it is expected that regular funds for this purpose will be supplied, by the present short session of Congress. A much discussed and considerably approved amount for use over the public lands has been $3,500,000 per year. If this last mentioned item should be authorized then the routine and yearly amounts of government funds that will be coming to Montana may be summarized approximately as follows:

Regular Federal Aid—to be matched on the basis of $56.00 of government funds and $44.00 of state funds—$2,500,000 per year.

For Forest Highway construction—100% money—$850,000 per year.

For building across other government land and Indian Reservations —100% money—$200,000 per year.

To further make evident the Montana situation it may be stated that, taking into account the surplus of Federal Aid funds that were made available to this state previous to the Seventy-first Congress, and the authorizations made in that Congress, as well as subsequent releases, it has come about that Montana has $6,000,000 to its credit provided state funds can be supplied to match this government money upon the required basis. In a single sentence of further explanation it may be added that the government is offering Montana $2,500,000 a year and the state under present revenues, has only about $1,500,000 per year for matching these construction funds after maintenance and other distinctly state expenditures have been taken care of.

Manifestly Montana is facing a problem of tremendous importance at the time when the people are urging with a constantly increasing insistence the completion of their trunk system of highways.

The Highway Commission and its engineers have given much time and study to the question of what this state may, or can or ought to do. Long time debentures clearly cannot be acted upon to supply revenue for use during the coming biennium. The Commission, therefore, has recommended and the Montana Automobile Association will sponsor a bill that is prepared and will be introduced at the opening of the legislative session now convening. This measure provides for the sale of gasoline tax anticipation warrants in amount $6,000,000 ($1,500,000 per year for four years) underwritten by a portion of the gas tax and to be liquidated in ten years. This method of financing has already been used in Idaho, New Mexico, South Carolina and Tennessee. The plan is to ask the approval of the Legislature at the earliest possible moment in order that, following enactment the measure may be submitted to the Supreme Court so that there may be no conflict in this act with the provisions of the Montana Constitution relating to indebtedness.

If this proposed statute shall be enacted and if it shall be approved by the highest court of the state, it is then confidently estimated that Montana can carry forward road construction with an expenditure of at least $23,000,000 in the next four year period. This will practically complete the Federal Highway System of the state under government standards of construction and give Montana an acceptable highway transport.

UNEMPLOYMENT LEGISLATION AT WASHINGTON

Just as this report is reaching the final paragraphs in preparation, the national congress at Washington enacts unemployment legislation which gives promise of being of great assistance to all of the states. The provisions of this legislation will enable the letting of contracts during the next few weeks, through funds that are to be advanced by the Government, in cases where local revenues are not immediately available. The proposal in Washington at first was to release Federal authorizations so that regular cooperative construction might go ahead. It became apparent, however, that many of the states would not have the local funds at once available. Therefore, at the solicitation of state highway officials of the public land states of the west, a three-fold plan was worked out whereby the Government is to loan money to the states in order to quickly match the regular Federal aid and enable the letting of contracts at the earliest possible moment—these loans to be deducted from future allotments of Federal aid beginning in 1933, and over a five year period, but these funds can only be used in payment of work completed before September 1, 1931. Of this emergency Federal aid, Montana may receive about $1,600,000. These emergency loans constitute the principal benefit that will come to Montana. However, there has been appropriated as emergency legislation for unemployment $3,000,000 of 100% forestry highway money. Montana may receive out of this appropriation, perhaps $300,000 to $400,000. A third emergency appropriation has been made of $3,000,000 for building over unappropriated public land. Montana may get $165,000 of this appropriation.

The Montana Highway Commission will hasten to make use of all these emergency funds. Its engineering is well ahead. It therefore appears that this can be done. Montana is notifying the Government that it will put under contract all of the emergency advancement unemployment funds that have been allotted to this State for use before September 1.

It will, of course, be readily understood that this special and emergency Government provision on account of unemployment does not at all remove the necessity of legislative action on the part of Montana to supply revenue for matching the present surplus of regular Federal aid funds, or future allotments. Since the unemployment legislation here described is for the most part in the nature of a loan, it does not change materially the relative situation between the Government and the State, or the need of State revenue to match the surplus Federal aid that now stands to the credit of Montana, and which must be taken away from the State, and re-apportioned to other states, if we are not able to match it in accord with the provisions of the Federal highway act.

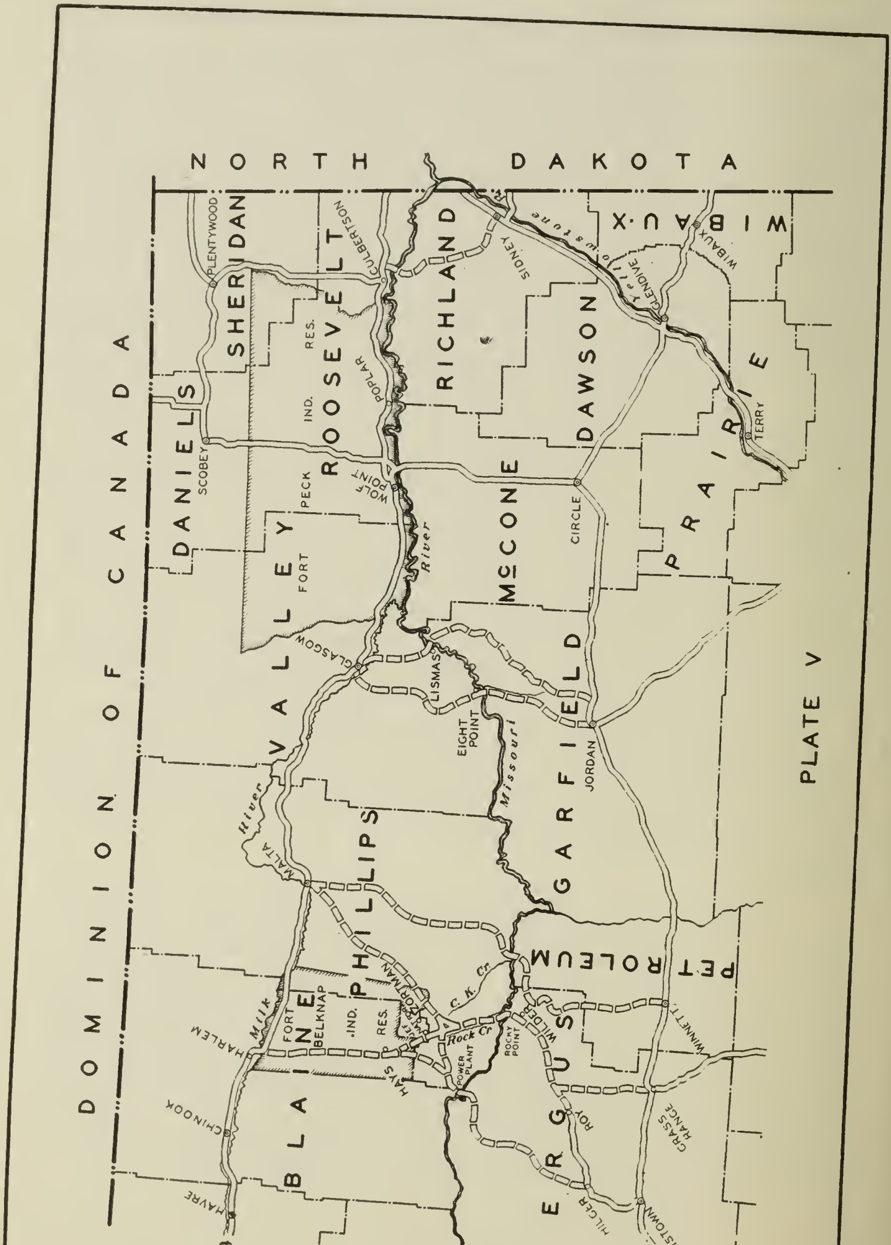

NORTH DAKOTA
DOMINION OF CANADA
SHERIDAN
ROOSEVELT
RICHLAND
WIBAUX
DAWSON
PRAIRIE
DANIELS
VALLEY
McCONE
GARFIELD
PHILLIPS
BLAINE
PETROLEUM
FERGUS
PLENTYWOOD
CULBERTSON
SIDNEY
GLENDIVE
WIBAUX
TERRY
POPLAR
FORT PECK IND. RES.
WOLF POINT
SCOBEY
CIRCLE
GLASGOW
LISMAS
EIGHT POINT
JORDAN
MALTA
ZORTMAN
FORT BELKNAP IND. RES.
HARLEM
CHINOOK
HAVRE
HAYS
POWER PLANT
ROCKY POINT
WILDER
ROY
WINNETT
GRASS RANGE
HILGER
LEWISTOWN
Yellowstone
Missouri
River
Milk River
C. K. Cr.
Rock Cr.

PLATE V

REPORT ON BRIDGE INVESTIGATIONS

House Joint Resolution No. 4

To the Honorable, The Highway Commission of the State of Montana:

WHEREAS, there is present an increasing need of highway bridges over the Missouri and lower Yellowstone rivers in the State of Montana; and

WHEREAS, the next session of the Legislature of the State of Montana may be interested in providing for the construction of such bridges;

BE IT RESOLVED, by the House of Representatives of the State of Montana, the Senate concurring,

That the State Highway Commission of the State of Montana be hereby requested to make necessary examinations and surveys preliminary to the location for construction of highway bridges over the Missouri and Yellowstone Rivers in the State of Montana, as follows:

At a crossing of the Missouri river on the Highway connecting Chinook and Malta with Lewistown.

At a crossing of the Missouri river on the Highway connecting Glasgow and Jordan.

At a crossing of the Missouri river on the Highway connecting Culbertson and Sidney.

At a crossing of the lower Yellowstone river at or near Sidney, Montana.

At a crossing between Winnett and Malta, Montana.

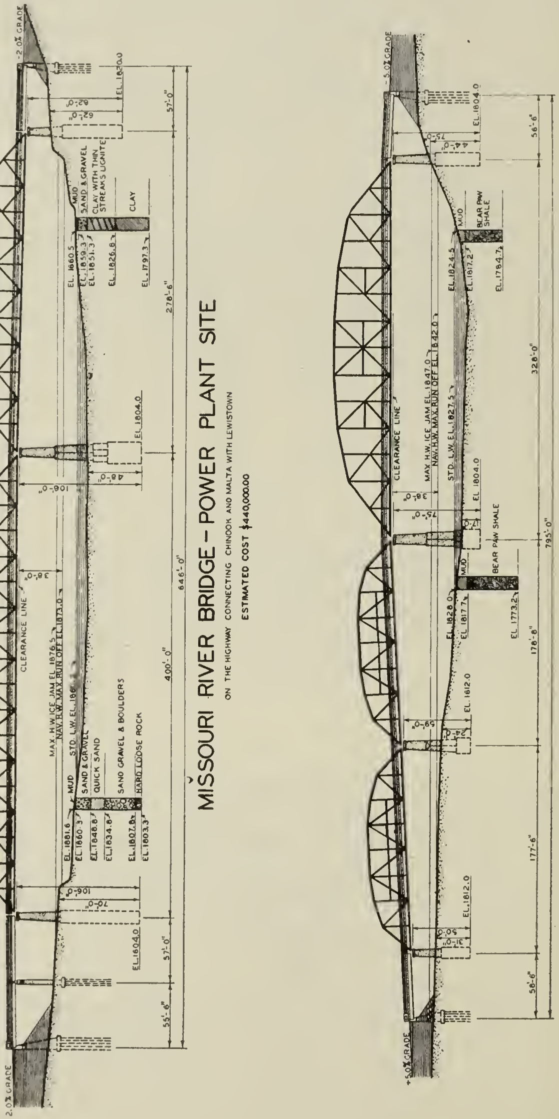
Such preliminary surveys, data, and estimates of cost, and any other desirable information herein requested, to be submitted to the Twenty-Second Session of the Legislature of the State of Montana, on or before the twenty-fifth day of January, 1931.

Approved March 12, 1929.

* * *

In compliance with House Joint Resolution No. 4 the Highway Commission assigned a bridge engineer of long experience to the investigation of the bridge sites named. A stern wheel boat, of thirty-three tons displacement owned by Captain Ira H. Slawson of Banks, North Dakota, was chartered for the purpose and a calyx core drill outfit was installed upon it in such a manner that borings could be made in the river bed through the bottom of the boat.

Inasmuch as the country adjacent to the Missouri River is extremely rugged and broken, a study of conditions affecting bridge sites and connecting road locations will always be very difficult from the shore. It became apparent, therefore, that while the boat was in use and rigged with the drilling outfit an investigation of all sites which appeared satisfactory for bridges should be made. The whole river was therefore examined from the mouth of the Judith River to the North Dakota boundary, a distance of 431 miles by river or about 260 miles in a straight line. Six possible sites were selected for investigation. These will be reported upon separately. (See Plate No. 5)



MISSOURI RIVER BRIDGE – POWER PLANT SITE

ON THE HIGHWAY CONNECTING CHINOOK AND MALTA WITH LEWISTOWN

ESTIMATED COST $440,000.00

MISSOURI RIVER BRIDGE – WILDER SITE (ROCKY POINT)

ALTERNATE FOR POWER PLANT SITE

ESTIMATED COST $325,000.00

PLATE I

ON THE HIGHWAY CONNECTING CHINOOK AND MALTA WITH LEWISTOWN

See Plate No. 1

Power Plant Bridge Site

Test borings made near the present ferry showed that suitable foundations could not be secured at a reasonable depth at that point and further investigation was made above and below the ferry.

The most favorable site for a bridge was found to be opposite the old power plant, about two miles east or down stream from the present ferry. The stream channel at this site is very nearly straight for a distance of one-half mile up stream and over two miles down stream. The banks show very little erosion, and practically none at the site selected. Ice gorges in this vicinity generally form at the head of an island over one-half mile up stream from bridge site, seldom below for several miles. These conditions are very favorable to this site, in fact, no other site was found on the river more favorably located in this respect. The channel between banks at the site is less than 620 feet in width at ordinary high water and 700 feet at maximum high water due to melting snow. The estimated cost of a bridge at this site is $440,000.

Road Connections to Power Plant Site

The highway from Malta to Lewistown via Power Plant and Hilger would be about 141 miles long and would cost approximately $1,520,000 for grading, drainage structures (except the Missouri River Bridge) and gravel surfacing. Allowance has been made for the work already completed between Lewistown and Hilger.

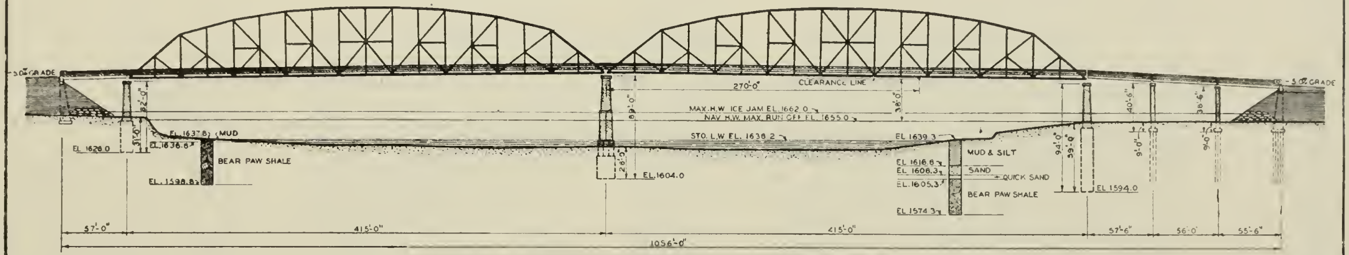
For traffic from Chinook to Lewistown, several alternative routes are possible via Power Plant. The one which would require the least expenditure of State Funds, however, would be from Chinook to Harlem via U. S. Highway No. 2 which is already constructed, thence south through the Fort Belknap Indian Reservation to a point near Hays, and from thence southwest to a connection with the Malta-Lewistown road about six miles north of Power Plant Ferry. Since this highway would lie mainly within the Indian Reservation and the National Forest, the Federal Government would probably pay a large portion of its cost. The distance from Chinook to Lewistown via Harlem and Power Plant would be about 152 miles.

Rocky Point Bridge Site (Wilder):

This site is an alternate for the Power Plant Site. The location selected is about two miles above the old Wilder ferry, and is less than 1,000 feet above the mouth of Rock Creek.

Above the bridge site the channel appears to be fairly permanent, although the northerly bank might need some protection, about one and one-half miles up stream, at some future date.

Test borings at this site showed more favorable foundation conditions than at any of the others. It is mainly this fact which brings the estimate of cost of a bridge here lower than that of the other sites. Bearpaw shale was found at a depth of from eight to twelve feet below

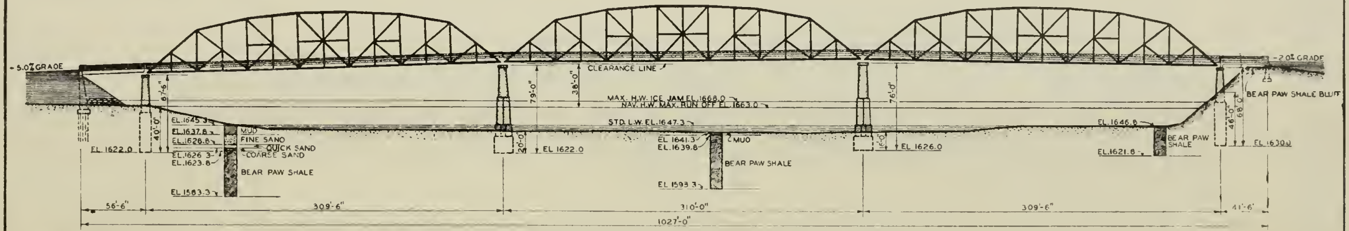


MISSOURI RIVER BRIDGE—LISMAS SITE

ON THE HIGHWAY CONNECTING GLASGOW AND JORDAN

ESTIMATED COST $490,000.00

$50,000.00 FOR BANK PROTECTION INCLUDED



MISSOURI RIVER BRIDGE—EIGHT POINT SITE

ALTERNATE FOR LISMAS SITE

ESTIMATED COST $440,000.00

PLATE II

low water level. The foundations of the Wolf Point Bridge are in bearpaw shale, and this material is considered excellent for foundation purposes, as it occurs in a thick bed and has good bearing power. The estimated cost of a bridge at the Rocky Point site is $325,000.

Road Connections to Rocky Point Site:

The distance from Malta to Lewistown via Rocky Point, Roy and Hilger on a well located highway would be almost exactly the same as via Power Plant. The distance from Chinook to Lewistown, however, would be about eleven miles greater via Rocky Point than via Power Plant. This distance is calculated on a highway routed Chinook-Harlem-Hays-Landusky-Rocky Point-Roy-Hilger-Lewistown.

At a point on this location about nine miles northeast of Roy and due north of Grass Range, a branch highway could be run directly south to Grass Range where a connection would be made with U. S. Highway No. 87 East.

The cost of a standard graded, drained, and gravel surfaced highway from Malta to Lewistown via Rocky Point and Roy is estimated at $1,345,000 for the 141 miles, allowance being made for work already done from Roy to Lewistown.

Comparison of the Two Routes

The Power Plant site has the following advantages:

1. It lies close to the existing road and any new construction would be immediately usable.
2. It would provide a shorter route from Chinook to Lewistown, although the distance from Malta to Lewistown would be the same by either route.
3. The most favorable topographical conditions due to straight channel and little bank erosion.

The Rocky Point Site has the follower advantages:

1. Lower first cost of both bridge and connecting roads.
2. A branch could be constructed to Grass Range which would make the shortest possible route from Chinook, Harlem or Malta to Grass Range, Billings and Wyoming.
3. Much better foundation conditions.

The total cost of the two routes including grading, drainage structures, and surfacing is as follows:

	Highway	Missouri River Bridge	Total
Malta-Power Plant-Lewistown	$1,520,000.00	$440,000.00	$1,960,000.00
Malta-Rocky Point-Lewistown	1,345,000.00	325,000.00	1,670,000.00
Difference	175,000.00	115,000.00	290,000.00

AT A CROSSING OF THE MISSOURI RIVER ON THE HIGHWAY CONNECTING GLASGOW AND JORDAN

See Plate No. 2

A special reconnaissance of the river was made from a point about five miles northeast of Lismas ferry to a point six miles west of Eight Point in search of favorable bridge sites. Only two were found which were considered worthy of further investigation. One of these was at the

Lismas ferry and the other was about one-third of a mile above the the mouth of Crooked Creek at Eight Point.

Lismas Bridge Site

This site is on the present road between Glasgow and Jordan. The Missouri river in this civinity flows in a general northeasterly direction, the valley bottom is about one and one-half miles in width. The stream meanders back and forth across the valley in broad easy curves, constantly cutting along one bank, and filling in along the other, alternating the cutting side at the bends, continually but slowly shifting its channel in the bottoms, but sometimes shifting several hundred feet in a very short time.

At the present time the river lies against the bluff along the north westerly side of the valley at the point of proposed crossing but takes quite a sharp bend to the left a few hundred feet up stream, running nearly at right angles across the valley, paralleling the proposed road and cutting rapidly in that direction.

Should this site be selected, bank protection for over one mile would be required, which, to make it adequate would cost not less than $50,000 and should be completed at the time the bridge is constructed and is included in the estimate of the cost of the bridge. Otherwise, ice jams and consequent change in direction of current might leave the bridge over a dry channel.

At the proposed crossing, about two hundred feet below the ferry the bearpaw shale outcrops along the bank on the westerly side of the stream, and shows in low water nearly half the distance across.

While the outcrop shows for several hundred feet along the westerly bank, on the easterly side test holes disclosed the fact that a shale dyke not exceeding 300 feet in width extended across the river with the top from thirty to forty feet below the water surface.

Test borings showed very irregular foundation conditions at this site, some of the holes encountering Bear paw shale at reasonable depth and others being sunk to a depth of between sixty and seventy feet without finding good foundation material.

The estimated cost of a bridge at the Lismas site is $490,000.

Road Connections to Lismas Site

The State Highway would follow generally the present county road from Glasgow to Jordan, if the Lismas bridge site were adopted. Some distance could be saved, however, by straightening out the present road. The distance by location survey would be about eighty-six miles. The cost of grading, drainage structures (except Lismas Bridge) and gravel surfacing from Glasgow to Jordan via Lismas, would be approximately $940,000.

Eight Point Bridge Site

About three miles above proposed crossing of the Missouri River at Eight Point the river leaves the bluffs on the northerly side of the stream, taking an almost straight course to a point about one-third mile above the bridge site in high bearpaw shale bluffs along the southerly side of the valley, thence following closely along the bluffs along the southerly side for about three miles.

The channel is doing a very little cutting along the northerly bank from about one-quarter mile up stream to a point where it leaves the bluffs on the northerly side of the valley, but the change is taking place very gradually and no protection would be required for several years although a small amount of money expended at time bridge was constructed would insure the permanence of the present channel for an indefinite period.

The valley is about one and one-half miles in width at bridge site, alluvial bottom, but extreme high water due to any cause rarely extends over 1,000 feet from the northerly bank, and along the southerly bank the bluff is over fifty feet in height, all bearpaw shale.

Test borings at this site show excellent foundation conditions with bearpaw shale at depths of from three to twenty-six feet below ordinary water level.

The estimated cost of a bridge at Eight Point is $440,000.

Road Connections to Eight Point Site

By the best routing the State Highway from the Eight Point site to Glasgow would be about forty miles long. From the bridge site to Jordan would be about thirty-four miles, making the total distance about seventy-four miles. The cost of a standard highway from Glasgow to Jordan via Eight Point would be about $820,000.

Comparison of Routes

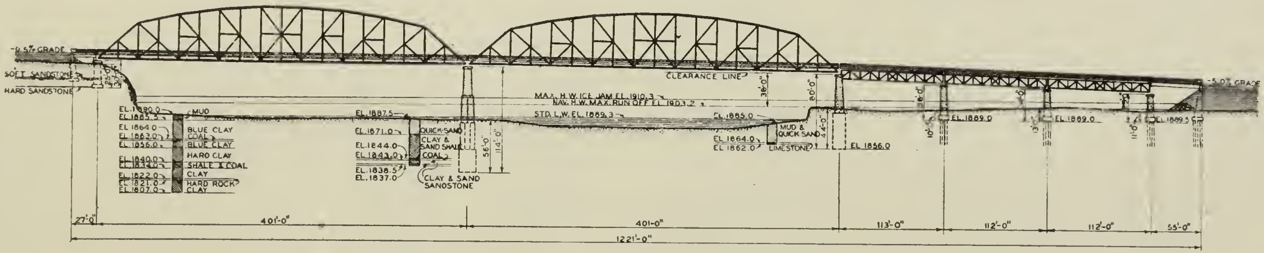
The Lismas route has one advantage over the Eight Point route, viz: a bridge constructed at Lismas would be immediately usable since it would connect with the existing county road.

The Eight Point route has the following advantages over the Lismas route:

1. Lower construction cost of both road and bridge.
2. Shorter distance from Glasgow to Jordan of twelve miles.
3. River banks are much more stable.
4. Foundation conditions are much better.

The estimated costs of construction of standard highways and bridges on these routes are as follows:

	Highway	Bridge	Total
Glasgow-Lismas-Jordan	$940,000.00	$490,000.00	$1,430,000.00
Glasgow-Eight Point-Jordan	820,000.00	440,000.00	1,260,000.00
Difference	$120,000.00	$ 50,000.00	$ 170,000.00



MISSOURI RIVER BRIDGE—CULBERTSON SITE

ON THE HIGHWAY CONNECTING CULBERTSON AND SIDNEY

ESTIMATED COST $530,000.00

$25,000.00 FOR BANK PROTECTION INCLUDED

PLATE III

0 10 20 30 40 50 100
SCALE IN FEET

AT A CROSSING OF THE MISSOURI RIVER ON THE HIGHWAY CONNECTING CULBERTSON AND SIDNEY

See Plate No. 3

Culbertson Bridge Site

The site selected is about three miles southeast of Culbertson. An examination of the River was made for other bridge sites, both up and down stream, but no other feasible site was found.

The Missouri river at this point is about 650 feet in width at low water, with its northerly shore lying along a high bluff in "bad land formation". The bluff at point of crossing is between fifty and sixty feet in height, rising abruptly from the edge of the river. This bluff for about forty feet in height is soft sandstone with a lignite seam running through it, from one to one and one-half feet in thickness. From the top of the bluff, the country is very rough and broken, rising rapidly to a ridge about one-half mile north of the river.

On the southerly side of the river the country is flat.

This site requires a longer bridge than any of the others. It will also require a rather deep and expensive center pier, due to the fact that foundations must be carried down to solid material which lies below a bed of quicksand in this vicinity.

The estimated cost of a bridge at this site is $530,000.

Road Connections to Culbertson Bridge Site

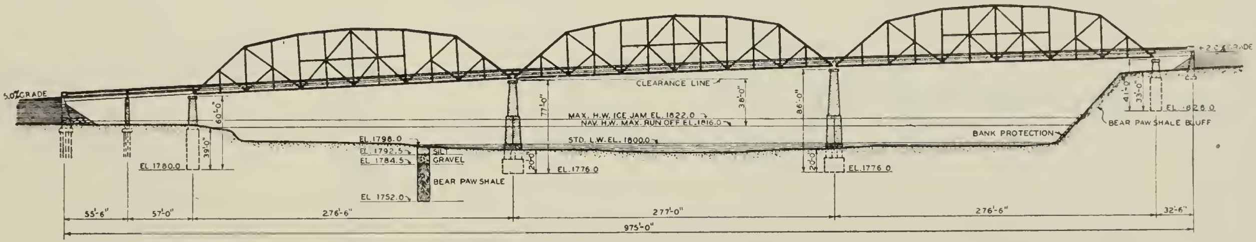
South of the bridge about one mile of new highway will connect the bridge with the existing Culbertson-Sidney road at the point where this road turns south after leaving the ferry. The total distance, following the best location, from Culbertson to Sidney would be about forty miles. The total cost of a standard surfaced highway, including all bridges except that over the Missouri River, would be approximately $415,000.

AT A CROSSING OF THE LOWER YELLOWSTONE RIVER AT OR NEAR SIDNEY, MONTANA

Bridge Site

The lower Yellowstone does not afford many satisfactory bridge sites. The one selected, about two and one-half miles south of Sidney, is probably the best available.

Inasmuch as arrangements were made by Richland County to issue bonds in the amount of $85,000 to pay a part of the State's share of the cost of this bridge, plans were completed and have been submitted to the Bureau of Public Roads for approval. It is probable that this approval will be secured early in 1931, and the contract will be awarded as soon thereafter as it can be advertised. The approval of the plans by the War Department has been secured. This bridge will be 1,220 feet in length.



MISSOURI RIVER BRIDGE – C K CREEK SITE

A CROSSING BETWEEN WINNETT AND MALTA

ESTIMATED COST $400,000.00

PLATE IV

AT A CROSSING BETWEEN WINNETT AND MALTA, MONTANA

See Plate No. 4

C. K. Bridge Site

This site is located about one mile down stream from the mouth of C. K. Creek.

There is little danger of channel change at this point for a long time but eventually some protection might be required for about one mile along the northerly bank to the mouth of C. K. Creek. At the bridge site the river is about 550 feet in width at low water and 725 feet at ordinary high water.

There is an alluvial bottom on the north for about one-half mile; on the south bearpaw shale bluff rises from the waters edge to a height of sixty or seventy feet, then rough broken slopes covered with brush and scrub pine on top of a bench to the south. The stream at this point of crossing is in what is known at the C. K. rapids. The stream bed consists of a few feet of silt, gravel and boulders above bearpaw shale, which is probably very deep and would afford a good economical bridge foundation. This is one of the best bridge sites found on the river.

The estimated cost of a bridge at this site is $400,000.

Highway Connections to C. K. Bridge Site

Topography is very favorable for a highway from Malta to this bridge site. Routing would be very direct and cost not above the average for prairie construction. From the bridge site southward toward Winnett the country is rough and broken but a standard highway can be constructed to the top of the bench without unreasonable expense. However, after reaching the high ground, it will be necessary to swing west ten or twelve miles before turning south to Valentine and Winnett, in order to avoid the "brakes" of the Musselshell River. From Valentine to Winnett the country is rolling and construction relatively inexpensive.

The total distance from Malta to Winnett would be about 116 miles via C. K. bridge site. The total cost of a standard surfaced highway, including all bridges except the Missouri River Bridge, is estimated at $1,180,000.

GENERAL STATEMENT

The foregoing estimates have been prepared by the usual reconnaissance methods and are as accurate as they can be made unless detailed plans were worked out and a contract actually awarded. Bid prices might vary as much as ten per cent from these estimates.

Bridge layouts and estimates were prepared in accordance with the navigation requirements of the War Department and also in compliance with the rulings and specifications of the Bureau of Public Roads for Federal Aid Bridges. Distances between towns have been estimated along the best highway location, and not necessarily along existing roads. Highway costs have been estimated in accordance with average prices during the past year.

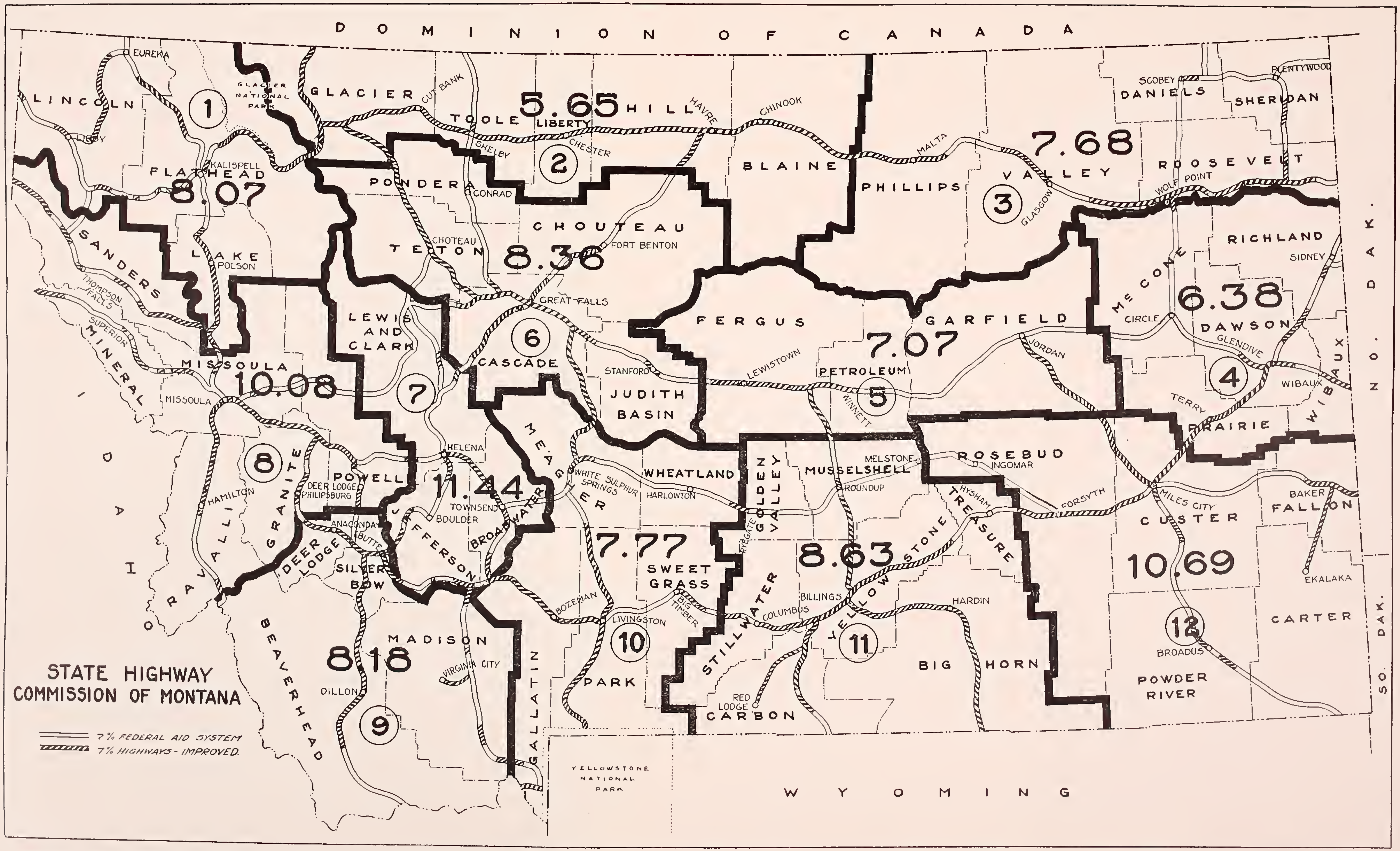
In making these estimates for both highways and bridges the aim has been to fix unit costs on the same basis throughout, modified by varying length of hauls of materials, different foundation conditions, and differences in erection costs at the various sites. In this way each cost estimate has been made truly comparable with all the others.

The Highway Commission in making this study and report on bridge sites along the Missouri River has endeavored to present as clear a picture of actual conditions as possible without prejudice or favor.

Respectfully submitted,

O. S. WARDEN, Chairman.
R. D. RADER, State Highway Engineer.

STATE HIGHWAY COMMISSION
Helena, Montana



Map showing construction districts of Montana and Federal Highway System. Circle figures designate districts—Large figures indicate statutory percentage of State construction funds. Status of Federal Highway Improvement Shown as of December, 1930.